2022

Patient satisfaction with service quality in Kenyan University Dental Hospitals

Edward Mungure Kabubei
Strathmore Business School
Strathmore University

PATIENT SATISFACTION WITH SERVICE QUALITY IN KENYAN UNIVERSITY DENTAL HOSPITALS

Edward Mungure Kabubei

Reg. No: MBA HCM 8027

A RESEARCH DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION HEALTHCARE MANAGEMENT AT STRATHMORE UNIVERSITY

STRATHMORE UNIVERSITY BUSINESS SCHOOL

NAIROBI, KENYA

JULY 2021

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

Name of Candidate …Edward Mungure Kabubei……

Signature  ……..

Date……16th November 2021……

Approval

The dissertation of Edward Mungure Kabubei was reviewed and approved for examination by the following:

Name of Supervisor: Dr. Pratap Kumar

School/Institute/Faculty: IHCM, Strathmore University Business School

Dr. George Njenga

Executive Dean

Strathmore University Business School.

Dr. Bernard Shibwabo

Director, Office of Graduate Studies

ACKNOWLEDGEMENTS

I would like to thank God for the opportunity to fulfil a lifelong dream of pursuing an MBA at Strathmore University Business School. I thank the faculty and administration of the Institute of Healthcare Management for making my learning a memorable experience. A special thank you to my supervisor Dr. Kumar, my class coordinators Mandela and Ann and the course coordinator Veronica. I thank my family and the syndicate members of delta for their support through the entire program.

ABSTRACT

Patients seek oral health services to alleviate pain, treat diseases affecting the teeth and face, improve aesthetics as well as to prevent and promote oral health. Patient satisfaction has many dimensions which include expectations, values, and actual experiences. It is a key indicator of measuring quality of healthcare. It affects patients' behavior on how quickly they seek and recommend healthcare services. This in turn influences how effective healthcare will be in terms of their compliance and it shapes how they utilize healthcare services in the future. The main objective of this study therefore was to determine patient satisfaction with service quality in University Dental Hospitals in Kenya. The research was based on the Donabedian theory of patient satisfaction (structure, process, and outcome) and the disconfirmation theory of consumer behavior applied using a SERVQUAL model. The study employed convenience sampling and a cross-sectional study design. Primary data were collected using a guided SERVQUAL questionnaire administered to 388 patients attending Moi University and The University of Nairobi dental hospitals before and after receiving services. The data collected was presented by use of descriptive statistics (mean and standard deviation) and inferential (multiple regression) using SPSS. The results showed that overall patient satisfaction was high with a mean satisfaction score of 93.9%; further, service quality influences patient satisfaction. Improving service quality increases patient satisfaction, revisit intention and recommendation. From the multiple linear regression model the five service quality dimensions positively and significantly influenced patient satisfaction. In addition, the service quality dimensions included in the model accounted for 62.7% change in patients' satisfaction. The model revealed responsiveness of healthcare givers as the most influential in boosting the patients' satisfaction, followed by assurance, reliability, empathy, and tangibles dimensions. The study further unraveled that overall service quality increase patient satisfaction and positively impact revisit intention and future utilization of services in University Dental Hospitals. This study therefore recommends to the management of healthcare facilities to invest more resources in making sure that the responsiveness, assurance, reliability, empathy, and tangibles dimensions of service quality are incorporated in their day-to-day service delivery programs as it bolsters their satisfaction and builds loyalty of their patients. The study limitation is that the population under study was confined to public university dental hospitals in Nairobi and Eldoret, Kenya. The findings may not be generalizable to other healthcare services or institutions. Future research can extend this to other sectors of the healthcare system and incorporate a qualitative component to better understand patient and provider behaviour.

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LIST OF ABBREVIATIONS

BDS- Bachelor of Dental Surgery

CHE- Catastrophic Healthcare Expenditure

COHO- Community oral health officer

DSQ- Dental Satisfaction Questionnaire

DT- Dental Technologist

GBD-Global Burden of Disease

HSP-Health Service Providers

IHI- Institute for Healthcare Improvement

KQMH- Kenya Quality Model for Health

NACOSTI- National Commission for Science Technology and Innovation

NCD- Non-Communicable Diseases

PE- Perception Expectation

PRO-Patient Reported Outcomes

SDG- Sustainable Development Goals

SU-IERC-Strathmore University Institutional Ethics Review Committee (SU-IERC)

UDH-University Dental Hospital

UHC- Universal Health Coverage

WHO- World Health Organization

WOM- Word of Mouth

DEFINITIONS

DSQ- dental satisfaction questionnaire

SERVQUAL-is a multi-dimensional research instrument, designed to capture client expectations and perceptions of a service along the five dimensions that are believed to represent service quality: tangibles, reliability, responsiveness, empathy, and assurance

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Oral disease affects greater than 50% of the world population however oral diseases have received insufficient attention and funding in the sphere of global health(Murray & Lopez, 1997). Dental care is costly averaging, 5% of total health expenditure and approximately 20% of out of pocket spending even in high-income countries exposing populations to catastrophic healthcare expenditure (GBD, 2018). Developing countries like Kenya have oral health care demands that far outstrip the capacity of existing healthcare systems (Murray & Lopez, 1997).

The Institute for Healthcare Improvement came up with a Triple Aim framework (Berwick et al., 2008) targeted at improving overall population health, enhancing patient experience (quality, patient-centeredness, safety, and timeliness of care) and reducing the cost of providing healthcare services to individual citizens). Effective delivery of oral health services is highly dependent on appropriate infrastructure (buildings, equipment, and commodities) (Birch et al., 2015).

Certain changes in the health system such as the establishment of corporate hospitals, the advent of third-party payers (particularly insurances) and the internet have increase patient awareness (Prakash, 2010). This has also resulted in patients having higher demands resulting in legal proceedings becoming a major concern for the dental profession in particular (Karhunen et al., 2015). The culture of litigation has been driven by overzealous lawyers willing to litigate as reprieve for patients when treatment is unsuccessful and unfortunately in some instances for personal gain (Laviv. et al., 2020).

The Institute of Medicine in 2001 set out the six aims of a quality healthcare system as: safe, equitable, evidence based, timely, efficient, and patient centred care (IOM, 2001).The latter three dimensions affect patient satisfaction and can be assessed by getting feedback from the patient who is the consumer of healthcare services. Patients are considered consumers of healthcare services which invokes the right to receive quality healthcare services Brown SW (1993). The emphasis on service excellence (doctor, patient, and organization) has drawn attention to customer satisfaction just like the corporate service industry. The benefits of satisfied patients are: enhanced loyalty, increased profitability, reduced interpersonal conflict, less litigation and professional satisfaction (Prakash, 2010).

Patient centered care is integral to increasing the overall satisfaction and wellbeing of patients (Ali 2016). Patient views and opinions are regarded as an essential component of service quality in healthcare Patient satisfaction is useful in measuring the overall quality of dental care provided. (Mahboub, 2018) Patient reported outcome measures of service quality are useful in understanding the perceived needs of patients for treatment and oral disease prevention (Afrashtehfar et al., 2020). Assessment of patient satisfaction is a useful tool in gauging the overall quality of service delivery and can help firms to plan for the future. The process of gathering patient views helps to identify areas of strength and weakness that can be improved on. (Ali. 2016)

Increased service quality enhances customer satisfaction according to Parasuraman et al. (1985) other authors have also acknowledged this fact (Lee et al., 2000). Service quality and customer satisfaction are both multi- dimensional constructs and should be studied along the same factors affecting each component (Sureshchandar et al., 2002). According to Sureshchandar et al. (2002) there exists a relationship between the two and that an increase in one is likely to lead to an increase in the other.

The need to cope with an increasingly competitive environment within healthcare has resulted in the recognition of patient satisfaction as a key indicator of quality (Scardina, 1994.) A key success indicator and a key indicator of success in health care is patient satisfaction. Patient satisfaction and quality have also been used to provide guidelines for health systems planning and policy formulation (Al-Borie & Damanhouri, 2013). There is a need to ensure a good quality of patient satisfaction reporting and the correct tools and means to obtain this information (Stein et al.,2015). The information obtained from patient satisfaction surveys helps to identify defects within the health system with the aim of improving them (Owaidh et al., 2018)

1.1.1 Service quality and relevance to healthcare

Parasuraman et al. (1985) and Asubonteng et al. (1996) conceptualized service quality as the perceptions resulting from a customer's comparison of expectations against the actual experience of a service. Lehtinen (1982) defined it as a construct of "physical" as the tangible elements involved, "interactive" how the customer relates with the provider organization and "corporate" which is the image the customer has of the firm .Service quality is a means to attaining and sustaining competitive advantage in the market

Service quality can be assessed by measurement of performance and outcome indicators. These indicators help healthcare organizations evaluate patient experience as they interact with a health

system (Mainz et al., 2003). “Structure” includes the material and human resources as well as organizational structure. “Process” describes the patient-doctor interaction which includes the diagnosis, treatment planning, and treatment or referral. “Outcome” measures describe how healthcare interventions impact the health status of patients (Donabedian, 1980)

Quality in healthcare is “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” as defined by the Institute of Medicine (IOM, 2001). Health systems quality has six components that are efficiency, acceptability/patient-centeredness, effectiveness, accessibility, equity, and patient safety (Allen-Duck,et al., 2017). Service delivery is the first building block of health systems defined by the WHO the others being health workforce, information, medical products, vaccines and technologies, financing, leadership, and governance (Manyazewal, 2017). An understanding of patient satisfaction and service quality has been recognized as key to improving services. The work of Donabedian (1980) described the significance of patient satisfaction and pioneered research in healthcare quality assurance. Patient satisfaction in healthcare has been studied both as a component of quality of outcomes (quality care assessment) as well as a standalone construct (Gill & White, 2009).

Service based companies have been forced to embrace service quality as a means to remain competitive in an increasing hostile global environment for businesses (Asubonteng et al., 1996). Service excellence has become an integral part of marketing strategies for firms in the service industry. Quality has been defined by Asubonteng et al. (1996) as the degree to which a service meets the desired expectation of the consumer. Parasurman et al. (1985) define service quality as “the discrepancy between consumers’ perceptions of services offered by a particular firm and their expectations about firms offering such services” They also highlighted the challenge of defining and modeling quality as a construct because of the challenges involved in defining it and measuring it. According to a model developed by Gronroos (1982) he postulated that consumers perceive services by comparing what they expected to receive against what they actually experienced. He described technical quality as what is being done for the customer and functional quality as how the service is delivered to the customer.

Expectations are shaped by word-of-mouth recommendation, past experiences, marketing communication as well as the customer’s personal needs (Parasurman et al., 1985). Based on the expectation –disconfirmation theory (Oliver, 1980) expectations have a great influence on how

customers perceive services and are difficult to change and this is especially when it is in an area that the customer is not well versed like healthcare. Positive disconfirmation is when the service experience was better than expected and negative disconfirmation is when the service experience was worse than expected (Oliver, 1980). The positive correlation between expectation and satisfaction is explained through an effect described as assimilation. Oliver (2010) found that when patients find that their actual experience is close to what they expected they tend to "assimilate" their actual experience to their initial expectation which was positive that the service meets expectations. On the other hand, the positive relationship between disconfirmation and satisfaction is explained by a contrast effect. That is when patient experience deviates from their original expectation they tend to exaggerate these differences (Oliver, 2010).

Healthcare meets the criteria to be defined as a service as it is intangible (it cannot be counted o measured) secondly it is heterogeneous (there is variability from one provider to another) third it is inseparable from the person providing it. The fourth feature is that it is perishable in that it must be produced and consumed at the same time (Parasuraman, 1985). This makes it difficult to measure quality as opposed to products which have a shelf life and can be measured (Gronroos, 1982). It is also difficult for a patient to measure quality of care because the outcomes of treatment take time to perceive and are dependent on many variables. (Xesfingi & Vozikis, 2016).

Service quality can have varied meanings in different contexts. It can refer to the relative superiority or inferiority of an organization or its services or as a degree of the discrepancy between consumers' perceptions and expectations (Parasuraman, 1985). Services are distinguishable from products by four characteristics (Zeithaml & Berry, 1988).

Intangibility	A service is an immersive process that is experienced by the customer
Perishability	Service is real-time and it cannot be stored for future use
Heterogeneity	The performance of the provider and the perception of the recipient vary among individuals and over time.
Simultaneity	Service is always consumed at the same time as it is produced

An understanding of patient satisfaction and service quality has been recognized as key to improving services. The work of Donabedian (1980) identified the importance of patient satisfaction and set the foundation for research in the area of quality assurance in healthcare. He defined the healthcare triad of structure process and outcome. Patient satisfaction in healthcare

has been studied and the findings well-articulated in literature both as a component of quality of outcomes (quality care assessment) as well as a standalone construct (Gill & White, 2006).

Allen Duck et al. (2017) defined healthcare quality as "the *assessment and provision of effective and safe care, reflected in a culture of excellence, resulting in the attainment of optimal or desired health"* The Institute of Medicine (IOM, 2001) defined quality in healthcare as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge". They went further to put forth a framework that described the six aims of a quality healthcare system as effectiveness, efficiency, accessibility, acceptability/patient centeredness, equity, and safety. Effectiveness describes service delivery that adheres to an evidence base and results in enhanced outcomes for individuals and communities. Efficiency is delivering services with the aim to maximize scarce resources while minimizing waste. Accessibility describes offering services when required, on time and by competent professionals. Acceptability in healthcare means to factor in individual preferences, cultures, and norms of communities where care is delivered. Equity demands that service quality does not vary on account of personal characteristics or demographics. Safety means that service provision should aim to minimize risk and harm to patients (IOM, 2001).
The area of service quality has generated much interest among the academic fraternity with many researchers trying to develop models to measure it. This is driven by the demand within the service industry to evaluate customer perceptions and the healthcare sector is no exception to this demand (Eshghi, 2008).

1.1.2 Customer satisfaction in healthcare

Customer satisfaction is the most frequently used customer centered performance metric by managers (Gupta et al., 2006) it has been studied extensively by many scholars in the field of marketing (Anderson et al., 1994; Anderson and Fornell, 2004) The generic nature of the construct customer satisfaction makes it cut across goods and services as well as the private and public sectors (Zeithaml, 1996).
Yi et al. (1989) described satisfaction as a judgment preceded by an act of purchasing or related to any engagement occurring between a customer and a provider. The disconfirmation of expectations (Oliver, 1993) has also been described well in literature. In this paradigm satisfaction is the response to a perceived difference between prior expectations and actual performance. Other authors such as Anderson et al. (1999) shifted the focus from transaction specific to

cumulative experiences to define satisfaction as an overall assessment of a customer experience of a good or service over time.

Patient satisfaction has been linked to important outcomes such as increased compliance, decreased service utilization, decreased litigation and better prognosis (Campen, 1995). The lack of consistent tools for measuring satisfaction has led to most surveys focusing on patient experience (Cleary, 1988). Patient experience describes attributes such as average waiting time, the quality of facilities and communication with healthcare providers. Social and demographic variables such as age, gender, race, education, and income are known determinants of patient satisfaction (Batbaatar et al., 2018).

Healthcare now operates within a competitive environment where health systems experts now see the need to address patient satisfaction (Afrashtehfar, 2020) and patient views form a vital part of quality assurance (Campen, 1995). As healthcare has moved into the era of evidence-based care there is a shift towards involving patients in making clinical decisions and patient satisfaction has been used as a measure of quality of care (Afrashtehfar, 2020). According to Suhonen et al. (2007)as far as quality is concerned in healthcare: (i) there is insufficient documentation about how illnesses of their customers are treated (ii) insufficient assessment of outcomes (iii) inadequate resource evaluation (iv) variations among providers in the treatment of similar conditions (v) absence of structured monitoring systems. The commonest means of obtaining patient views is through satisfaction surveys. The satisfaction measuring instrument used needs to be reliable and valid (Campen, 1995)

The concept of revisit intention is derived from behavior. It refers to the aim of a customer to maintain an ongoing relationship with a service provider and purchasing a service from the same provider (Seoho Um et al., 2006). A memorable and excellent experience triggers their intention to seek services from the same provider (Wandebori & Pidada, 2017). Repurchase intention refers to the future purchasing behavior of a consumer from the same provider. (Hellier, 2003) It is a future behavior that is exhibited after purchase of goods or services have been made (Boulding, 1993) and has been used in satisfaction/service quality literature as a dependent variable. Several studies have linked service quality that meets customer expectations with future purchasing behaviors (Cronin, 1994).

Sheau-Fen et al. (2007) demonstrated that quality of service and satisfaction have a positive effect on revisit intentions, and they are a source of competitive advantage for firms. Studies have shown that the quality of a service logically precedes the satisfaction of a customer. Customer

satisfaction has a stronger influence on repurchase intentions than the quality of service (Cronin, 1992).

1.1.5 Oral health in Kenya

The Bill of Rights (Constitution of Kenya, 2010) is enshrined within the Kenyan constitution of 2010, and it gives citizens the right to the highest attainable standards of health. This is consistent with the World Health Organization's declaration that health is a fundamental human right (Larson, 1996). It thus demands a commitment of nation states to strive to achieve the highest level of health for all. Good oral health has been attributed to better overall health, wellbeing, and an increased quality of life (Baiju, 2017).

Oral health is listed as the ninth element of primary healthcare in the Kenyan health system. To achieve UHC there is a need to increase access to care and to improve the quality of services. (Salari et al., 2019) Delivery of oral health services is capital intensive, it requires proper infrastructure, costly equipment, skilled personnel, and a constant supply of medical and non-medical materials (Birch et al., 2015).

The population of dentists in Kenya is slightly over 1000 for a population that exceeds 45 million, the demand for services by the growing population leaves the few providers overstretched and pricing out the majority of Kenyans who are poor. The population of dentists and oral health professionals is concentrated in urban centers leaving rural and marginalized areas underserved. (*2019 Kenya Population and Housing Census: Volume II i*, 2019) (Kenya National Oral Health Survey Report, 2015)

Oral health services in Kenya are provided by national referral hospitals, multi-level county hospitals, public university dental hospitals, non-governmental organizations, faith-based organizations, and private institutions. The oral healthcare sector in Kenya is led by dentists who are trained both locally and internationally. The other cadres in the oral health sector are community oral health officers (COHO) and dental technologists. COHOs' are trained to promote, prevent, and provide primary oral healthcare services such as extractions and cleaning of teeth in the community. Dental technologists are trained in the fabrication of dental and maxillofacial prosthesis in dental laboratories. On average Kenya trains 60 dentists, 1000 COHOs and 70 DTs annually. Training of oral health professionals is currently not based on any form of needs assessment. (Kenya National Oral Health Survey Report, 2015).

Kenya has two Universities training dentists at both undergraduate and graduate levels: University of Nairobi School of Dentistry and Moi University School of Dentistry. University teaching hospitals are engaged in training, research and providing dental care to patients. In these institutions, dental services are provided directly by trainees under the supervision of clinical instructors and university academic staff. They serve a dual need of meeting the training requirements of students while providing needed care to patients. (Kenya National Oral Health Survey Report, 2015).

1.2 Problem Statement

Assessment of patient satisfaction is a useful tool in gauging the overall quality of service delivery and can help firms to plan for the future (Ali, 2016). Patient views and opinions are regarded as an essential component of service quality in healthcare (Mahboub, 2018). Patient satisfaction is useful in measuring the overall quality of dental care provided (Luo et al., 2018). The lack of consistent tools for measuring satisfaction has led to most surveys focusing on patient experiences such as waiting time, quality of facilities and communication with healthcare providers. (Cleary, 1988) Social and demographic variables such as age, gender, race, education, and income are known determinants of patient satisfaction (Batbaatar et al., 2018).

The commonest means of obtaining patient views is through satisfaction surveys. The satisfaction measuring instrument used needs to be reliable and valid (Campen, 1995) Patient satisfaction in oral health has been studied primarily using industry specific tools such as the Dental Satisfaction Questionnaire (Ahmady et al., 2017). This poses a significant challenge in comparing findings with other service industries due to a lack of standardization (Ahmady et al., 2015). Service quality in healthcare encompasses various dimensions including technical and functional aspects (Fatima et al., 2019). A systematic review by Endeshaw (2021) reviewed quality measurement models for a thirty-six-year period 1979-2015 with 74 studies selected for analysis. The key words for the literature search were “measurement models” SERVQUAL”, “SERVPERF” “healthcare” “service quality” “HEALTHQUAL” “PubHosQual” and “HospitalQual”. They reported lack of consensus among academics on the definition, indicators of quality in healthcare. Most tools used are of Western origin and are not sensitive to cultural and economic differences with developing countries. Despite numerous empirical and theoretical criticisms SERVQUAL remains a valuable tool for research in the area of service quality (Ladhari, 2009; Ahmady et al., 2015). It is also the most commonly used tool to measure healthcare service quality in both developing and developed countries (Fatima et al., 2019).

Customer service and quality are critical strategic issues for public sector firms including healthcare organizations (Wisniewski, 1996). The lack of standardized reporting on quality in oral healthcare services with over reliance on industry specific tools poses a challenge in both reporting and comparison of quality oral health services with other service sectors (Ahmady et al., 2015). SERVQUAL is a tried and tested instrument for measuring quality performance within the service sector and makes comparison across service sectors for benchmarking possible (Brysland 2001).

This study employed the SERVQUAL questionnaire to measure patient satisfaction and also addressed the future health seeking behavior of patients in Kenyan University Dental Hospitals (Parasurman et al 1985). It expands the existing the body of knowledge in healthcare quality in the Kenya public health sector by assessing the five areas which encompass physical (tangibles) and human (reliability, responsiveness, assurance, empathy) factors that impact service quality in the oral health sector.

1.3 Research objective

This section describes the overall study objective as well as the specific objectives that this study set out to achieve

1.3.1 General objective

To determine patient satisfaction with quality using the SERVQUAL model as well as revisit intention and willingness to recommend services at public university dental hospitals in Kenya.

1.4 Specific objectives

a) To determine patient satisfaction with:

i. tangibles which include physical infrastructure, equipment, medical devices and presentation of personnel in Kenyan university dental hospitals
ii. reliability is the ability to perform the service dependably and accurately in Kenyan university dental hospitals
iii. responsiveness which is the commitment to provide support and give the required services on time in Kenyan university dental hospitals
iv. assurance which is is the friendliness, competence, credibility of employees and how these abilities instill confidence and build trust in Kenyan university dental hospitals
v. empathy which is caring, and individualized attention given by employees in Kenyan university dental hospitals

b) To determine the willingness of patients to revisit and recommend treatment at public university dental hospitals in Kenya,

1.5 Research question

a) What is the overall level of patient satisfaction with the service quality in public university dental hospitals in Kenya in these five dimensions of SERVQUAL model?

   i. What is the level of satisfaction with tangibles in public university dental hospitals in Kenya?

   ii. What is the level of patient satisfaction with reliability in public university dental hospitals in Kenya?

   iii. What is the level of satisfaction with responsiveness in public university dental hospitals in Kenya?

   iv. What is the level of satisfaction with assurance in public university dental hospitals in Kenya?

   v. What is the level of satisfaction with empathy in public university dental hospitals in Kenya?

b) Are patients willing to revisit and recommend treatment at public university dental hospitals in Kenya?

1.6 Scope of the study

The study was limited to the five dimensions of SERVQUAL by measuring a perception-expectation gap among patients seeking oral health services at Moi University and Univesity of Nairobi dental hospitals as well as their revisit intention and willingness to recommend the services. The data for the study were collected over a span of four months starting in December 2020 and ending in March 2021.

A quantitative approach was used in the study through the perception-expectation gaps scores and weighting of the five variables used to compute an overall weighted SERVQUAL score. A structured questionnaire with a seven-point Likert scale response system was used to collect the data for the study.

1.7 Significance

This study measured the gap between patient expectations and perceptions of tangibles, reliability, responsiveness, empathy, and assurance in university dental hospitals. It expounded on how overall satisfaction influenced revisit intention as well as word of mouth recommendation of the services.

The findings of this research provide a quantitative assessment of satisfaction and healthcare quality as a guide to patient centered care. The results herein can be used to support evidence-based policy formulation, planning and implementation of dental services in the studied Institutions University dental hospitals are good models to study as they are actually the largest capacity outpatient dental facilities in Kenya.

The findings can shed light on how service quality affects overall patient satisfaction and can enable organizations to optimize their service delivery process. This understanding can guide organizations on prudent allocation of resources to improve efficiency and ensure future sustainability of public university dental hospitals in Kenya.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the relevant literature in line with the research objectives. It describes my theoretical background of patient satisfaction. It expounds on service quality, the SERVQUAL model, patient satisfaction and revisit intention to enhance our understanding of the topic. An empirical review of the literature and an outline of the conceptual framework are included.

Theoretical framework

Theories are formulated to help us better understand phenomena as well as to critique and expound on existing knowledge The theoretical framework introduces and describes the theories that explain why the research problem exists (Abend, 2008).

2.2 Patient Satisfaction

The theories of patient satisfaction are described below with description of their application in this study either in their entirety or partially. The reasons as to why some aspects of the theories could not be applied in this study are also explained.

2.2.1 The discrepancy and transgression theory by (Fox and Storms, 1981)

In this theory Fox and Storms (1981) proposed to measure the level of satisfaction by comparing the alignment between patient orientation and the provider's conditions of care.

This theory postulates that the quality of care is a measure of the degree of congruence between the patient and the provider. If the difference between the patients' orientation of care and the providers conditions of care is minimal then the patient is satisfied. If the difference however is great, then the patient is dissatisfied.

This study derives its theory in part to this proposition by Fox and Storms (1981) in one aspect of patient perception of care measured against their prior expectation by measuring the gap score. The study addresses the provider conditions of care also in the physical conditions (tangibles) as well as the human dimensions such as reliability, responsiveness, assurance, and empathy.

2.2.2 The Expectancy-value theory described by (Linder-Pelz, 1982)

In this theory by Linder-Pelz (1982) theorized that patients have personal convictions and beliefs about what a healthcare experience ought to be. Similarly, patients have also had prior experiences that influence their perception of satisfaction. They identified a variation in satisfaction scores as a result of these prior expectations and operationalized patient satisfaction as "positive evaluations of distinct dimensions of healthcare". Work by Strasser, (1993) developed this further into a six-component psychological factor model. The model identifies that 1) it is a multidimensional construct 2) formation of cognitive (thoughts, beliefs) and affective (emotions, feelings) perceptions 3) it is a dynamic process 4) there is a change of attitude that occurs 5) it is repetitive in nature 6) it is influenced by individual differences. The expectancy-value theory which relies on qualitative data exceeded the scope of this study which utilized a quantitative approach and thus not a good fit.

2.2.3 Multiple models theory described by (Fitzpatrick & Hopkins, 1983)

The authors postulated that satisfaction was a social construct which reflected patient objectives and how illness and health provision violates the patient's individuality. They concluded that the individual concerns of patients in regard to their illness ought to be more directly considered in understanding response to medical interventions.

Three key concerns were cited amongst patients in neurological clinics (p306- 307)

1. A concern for reassurance. If patients were anxious but were hoping for the best, they felt a sense of relief (satisfaction) when they were told that it was nothing to worry about. Those however who thought the worst but were reassured not to worry felt dissatisfied with the explanation and information from the doctor
2. A concern for symptom relief. Those who received prescriptions for treatment were either favorable or neutral and stressed the need to "wait and see" if the medication would work. A smaller proportion who received no tangible intervention from their visit expressed dissatisfaction.
3. A concern for preventive intervention. Patients who were well versed with symptoms of their disease, had studied it extensively had expectations for doctors to give them greater insight into their illness. They reported being dissatisfied by the doctors when they felt they did not exert themselves to dig further or do more tests. Patients who were less inclined to this manner reported greater satisfaction with the doctor consultations.

The Multiple Models Theory focuses on the patient doctor relationship. This study aligns with this theory in regard to the need to collect patient views and how they feel about the overall

experience. The scope of the study however is limited to a quantitative model that could not establish the specific predisposition of patient responses to certain interventions or aspects of care. This study also went further to address how patients perceive the tangible environment within which care is provided as part of satisfaction.

2.2.4 Healthcare quality theory (Donabedian, 1980)

Donabedian is considered the architect of the field of quality in healthcare (Sunol, 2000). He described three ways of improving efficiency in healthcare:

1) Clinical efficiency is use of clinical competence and skill to prescribe and give care that is not harmful or less effective
2) Production/managerial efficiency is the efficient production of goods and services that are used for providing care
3) Distributional efficiency describes the efficient distribution of healthcare services among different classes of patients (age, sex, ethnicity, economic status, place of residence)

(Donabedian, 2003 p-10)

He went further to describe a three-factor model of healthcare quality which comprised of structure- describing how healthcare is organized and the context in which it occurs. Second is process which is what actually happens in the interaction between a patient and the healthcare system. Lastly is the outcome which describes what happens to the patients' health as a result of this interaction with the health system. (Donabedian, 1966)

The present study derives significantly on the first two aspects of healthcare quality namely structure (tangibles and reliability and process (assurance, responsiveness, empathy. The health outcome variable proposed is however outside the scope of the study. This theory is the one applied in the current study.

2.3. Models of service quality

The need to measure service quality in management has created the need to develop valid instruments to do so.

2.3.1 Groonroos model (Groonroos 1982, 1984)

Groonroos postulated that service quality is defined as the gap between perceived quality and expected quality. In this model the authors proposed that firms should aim to reduce this gap as much as possible to increase customer satisfaction.

He described three dimensions of service quality

i. Technical- what customers receive when they engage with a firm (what?)
ii. Functional/process-how the firm engages with the customer (how?)
iii. Corporate image-how the customer views the firm's image and brand

There are also other factors that influence brand image such as traditional advertising methods as well as word of mouth recommendation of the firm. It was a commendable effort at developing a service quality mode. Its shortcomings however were that it lacked explanations on how to measure technical and functional quality.

2.3.2 Service quality gap model (Parasuraman, Zeithaml, and Berry 1985)

The disconfirmation theory pits perceived service experience against expectations. Parasuraman (1985) used this theory to and proposed a model for measuring service quality by measuring the gap between perceived service and expected service. This theory was derived from consumer behaviour and posits that a consumer develops different expectations of service quality from personal experience, word of mouth, and advertising or in other ways. This implies that consumers apply different standards in forming their perceived rating our judgments on satisfaction (Cardozo, 1965; Erevelles & Leavitt, 1992).

Expectations thus form the backdrop against which the consumer contrasts service experience and thus quality. This is similar to the contrast between how we perceive temperature change when we step out into the cold or step out of a dark room into bright sunshine on a sunny afternoon. Oliver (1980) Expectancy disconfirmation theory has been demonstrated to be a predictor of customer satisfaction with products as well as services in both the public and private sector (Anderson, 1993).

The difference between expectations and performance is referred to as disconfirmation which can either be positive (performance exceeds expectations) while negative disconfirmation (performance short of expectations) produces lower satisfaction.

Parasuraman et al. (1985) developed a conceptual model based on this theory to study service quality in service industries and identified five gaps that could affect how customers evaluate a service 1) consumer expectation-management perception gaps 2) management perception-service quality specification gap 3) service quality specification-service delivery gap 4) service delivery-external communication gap 5) expected service-perceived service gap.

The inception of SERVQUAL was a publication titled "A conceptual model of service quality and its implications for future research" in the Journal of Marketing where the authors postulated a "Service quality gap model" (Parasuraman et al., 1985). The initial model had ten elements which were later reduced to the following five:

1. Tangibles- equipment devices physical infrastructure presentation of personnel.
2. Reliability- dependability and accuracy of service delivery
3. Responsiveness- the willingness to assist customers and provide timely service
4. Assurance- the competence and credibility of employees and their ability to inspire trust and confidence
5. Empathy- the personalized attention and care that the firm provides to its customers.

(Parasuraman et al.,2009).

This led to the development of a service quality evaluation tool called "SERVQUAL" comprising 22 questions in 5 subsets that corresponded to the elements of the perception-expectation quality gap model (Zeithaml & Berry, 1988). This model suggests that the gap between customer expectation and their actual experience of a service determines their perception of quality.

2.3.3 SERVPREF model Cronin and Taylor (1994)

The authors proposed a new model for measuring service quality based on SERVQUAL. Cronin and Taylor postulated that performance is the only factor that needs to be measured for service quality. They proceeded to measure perceived service using the same five dimensions of SERVQUAL as opposed to measuring a perception-expectation gap.

2.3.5 Hierarchical model (Brady & Cronin, 2001)

The authors postulated that service quality perception is a multilevel and multidimensional construct. The authors adopted interaction quality (function) quality and outcome (technical) quality from (Groonroos, 1982, 1984) and went further to add a third-dimension service environment. Each dimension had sub dimensions listed below:

i. Interaction quality-attitude, behaviour, and expertise
ii. Physical environment quality-ambient conditions, design & social factors
iii. Outcome quality-waiting time, tangibles, valence

2.3.6 Choice of a suitable model

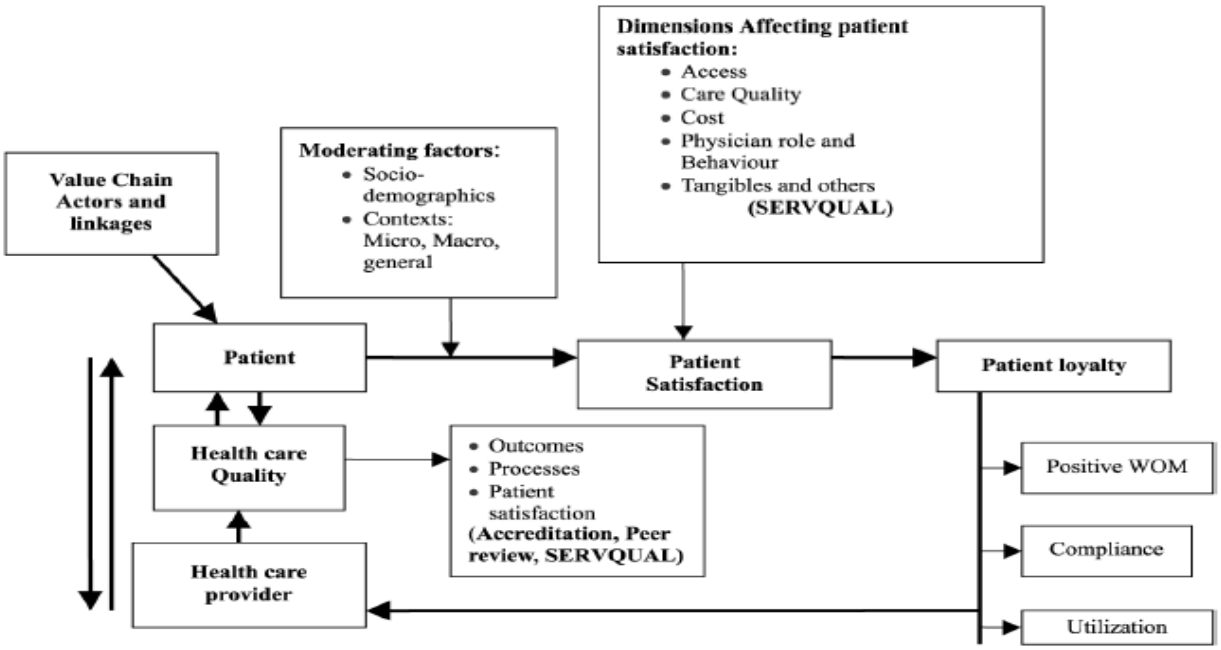
A study by Gilbert et al. (2004) reviewed the ways in which service quality can be measured as 1) The expectancy-disconfirmation approach 2) Performance only approach 3) technical and functional dichotomy approach 4)service quality vs service satisfaction approach 5 attribute importance approach.

SERVQUAL is among the most known service quality models and among the widely used ones in the service industry. This is because of its inherent practical applicability and thoroughness. It has also been used by stakeholders in healthcare for analysing the perceptual gap in

understanding patient needs. It has been found to measure the difference between patient preferences and experience effectively. The five dimensions that makeup SERVQAL are also reliable measures for use in the healthcare industry. (Al-damen, 2017).

SERVQUAL works by measuring the discrepancy between a customer's expectation and their perceptions after receiving a service. It requires the respondents to answer a series of questions about their perceptions and expectations this difference between perceptions and expectations is described as the gap which determines perceived service quality (Parasuraman, 1985).

Multiple models have been described in literature, the SERVPREF model was derived from SERVQUAL by assessing a customer's overall feeling towards the service (Cronin et al., 1992). (Brody & Cronin, 2001) proposed a three primary dimensional construct of service quality 1) interaction quality 2) physical environment quality 3) outcome quality. Teas et al. (1993) proposed a model that measures the gap between perceived experience and the ideal product features as opposed to customer expectation.



Note: Bracketed phrases explain how particular concepts can be measured

2.4 Criticisms of SERVQUAL

SERVQUAL as a model has been criticized as far as its reliability and validity in measuring quality (Cronin et al., 1992). Theoretical criticisms include 1) It is based on a disconfirmation paradigm rather than an attitudinal one 2) it focusses on the process of delivery rather than quality of

outcomes 3) the gaps model does not necessarily tally with how customers perceive satisfaction 4) the five dimensions are not universal in measuring quality, and they have overlapping attributes (Buttle, 1996). Operational criticisms include the fact that the five items do not capture variability within each service quality dimension exhaustively, the seven-point Likert scale is flawed, and it can be confusing for customers to score, two sets of questions for perception and expectation make it boring (Buttle, 1996).

Table 1: A Summary of the criticisms and commendations of SEVQUAL

Conceptual Basis	
Parasuraman et al. (1988) developed the scale on the basis of perceived quality.	Cronin and Taylor (1992, 1994) Oliver 1980 Argued that perceived quality is an attitude
Capturing of data related to the participants' economic data such as their level of education, income source and levels of income can be captured depending on the study being conducted. This was done in this study by gathering bio daya such as age, occupation/employment status and average income level.	Andersson (1992) cited failure to use economic, statistical & psychological theory in developing the model Andersson (1992) cited failure to use economic, statistical & psychological theory in developing the model. Failure to take into account the cost of improving quality. Data is collected using ordinal methods and the subjected to methods like factor analysis which are better suited for interval data
Process orientation	
SERVQUAL has been criticized for its focus on the process of service delivery (function). Higgins et al 1991. Argued that the technical quality is captured in the dimensions of reliability, reliability and assurance. Tangibles capture the physical environment within which the service is provided in.	Gronroos (1982) came up with three components of service quality. 1. Technical (outcome, 'what'). 2. Functional (process, 'how'). 3. Reputational (the corporate image of the firm).

The qualitative aspects to measure emotions and behaviour were beyond the scope of the current study.	Brady et al 2002 postulated that the service environment and others such as emotions and behaviour play a part in perceptions of satisfaction.
Dimensionality	
Llosa et al 1998 concluded that SERVQUAL five-dimension model still remains much easier to use. Brady et al 2002 concluded that confirmation of SERVQUAL's five factors scale continues to elude researchers.	Studies by Babakus & Mangold 1989,Carman 1990 have failed to verify the twenty-two-dimension construct described by Parasuraman et al 1988 Cronin & Taylor 1992 went further to propose a unidimensional construct of service quality but their findings have not been corroborated (Llosa et al 1998)
Expectations	
Parasuraman 1993 acknowledged that perceptions alone outperform gap scores in terms of overall evaluation of service and behavioral intent. However, he argued if that is reason enough to forfeit more accurate diagnostics for service quality evaluation.	Cronin & Taylor argued that their alternative tool SEVPREF which only measures perceptions is superior to SERVQUAL , Brady et al 2002 and other studies have demonstrated this
Difference scores and psychometric problems	
Parasuraman 1991 recommended SERVQUAL as a skeleton for service quality and should be used in in its entirety as much as possible with only minor modifications in the wording to adapt to specific needs are acceptable, deleting items affects the integrity of the scale.	Brown et al 1993 criticized SERVQUAL's interpretation of service quality in terms of differences in scores that create a new variable that is used in subsequent analysis. This further raised questions as far as the reliability ad validity of the scale
Gap scores	
Parasuraman 1985 perceived service quality as the degree and the direction of the discrepancy between consumer perception and expectation. Parasuraman et al 1991 included importance weights allocating a number of points per item that totaled to 100. It was after doing so that the weighted gap scores were then further subjected to analysis.	Van Dyke et al 1997 Data obtained from SERVQUAL gap scores as proposed by Parasuraman 1988 shows no evidence between overall service quality and gap scores and averaging the variables is unjustifiable due to the instability of the dimension structure. They proposed that each item be measured individually with the relative importance of each individual item considered.
Problems with Likert scales	
The alternative questionnaire formats claiming superiority to SERVQUAL still rely on Likert scales	Interpretation of the mid-point is challenging to analyze and there have

to record respondent value judgments with variation only in the format of the scales. Preston & Colman 2000 found that the optimal scale length falls between four and seven categories	also been several criticisms about the seven-point Likert scale (Danaher 1996) (Babakus et al 1992)

Despite these criticisms there is consensus in literature of the multi-dimensional nature of measuring quality and strong evidence to support customer satisfaction being a derivative of quality service. (Babakus et al., 1992). SERVQUAL was thus found to be a reliable and valid model for the study of patient satisfaction in this study. Service quality was thus measured from the patient's perspective (Parasuraman, 1985) and we postulated that satisfaction can be measured from perceived service quality (Negi, 2009). This included the dimensions provided for by (Parasuraman et al., 1988) as being suitable in measuring service quality and patient satisfaction in this study. SERVQUAL is a helpful operationalization of a vague construct which is service quality (Buttle 1996), further research is required to come up with new approaches to measure service quality. At present however no alternative that is as popular and dominant in the market has been produced. (Brady, 2002).

2.5 Word of mouth recommendation

Word of mouth recommendation refers to consumer to consumer communication about goods or services (Katz et al., 1966). It can influence the decision to purchase or the review after purchase, it can also be positive or negative (Brown et al., 2007). It is person to person communication about a brand product or service that is non-commercial (Arndt, 1967) or that is independent of commercial influence (Litvin et al., 2008). It goes over and above commercial advertising and involuntarily influences customer decision making (Brown et al., 2007) It is considered the primary driver of consumer decision making and intention to buy and particularly in the service industry where products are intangible (Litvin et al., 2008). The fact that the information is separate from commercial interests make it a credible source of information (Brown et al., 2007).

According to Daugherty et al. (2014) it is a powerful tool and a persuasive force especially when it comes to the adoption of new products. It is particularly important in the service industry where customers rely heavily on the suggestions of others who have experienced the service. Consumers trust information from other customers more than the firm (Cheung et al., 2012). Customer satisfaction is a determinant of positive word of mouth recommendation and thus firms should strive to satisfy them to expand their client base (Kitapci et al., 2014).

2.6 Repurchase intention

A primary business performance indicator is customer satisfaction that leads to loyalty, repurchase and word of mouth recommendation (Anderson & Sullivan, 1993). Customer loyalty brings great benefits to a firm and thus many firms have invested in customer loyalty/retention programs and relationship management schemes (Halowell, 1996) The benefits of customer loyalty include: revenue growth, reduced marketing costs, reduced operation costs, increased customer loyalty as well as per customer revenue (Reicheld &Teal,1996).

Previous research has focused on the relationship between customer satisfactions and repurchase, but it has been found out to be more complex than expected (Anderson & Srinivasan, 2003) Some authors such as, Garbarino and Johnson (1999) have postulated that trust and commitment forms a relational basis for loyalty and repurchase intention. Loyalty has been defined in two main ways using a behavioural and attitudinal approach. Behavioural approaches have been defined as those who rebought a brand, considered no other brand nor sought information about other brands (Dekimpe et al., 1997). The attitudinal perspective described by Oliver (1999) has four phases:

i. Cognitive- based on past knowledge or experience about a brand
ii. Affective phase- a liking or positive attitude or feeling towards a brand that remains subject to switching
iii. Conative loyalty- describes a behavioural intention to keep purchasing in the future which makes it more difficult to dislodge than affective loyalty
iv. Action loyalty is where motivated intention becomes a readiness to take action

The characteristics of loyal customers have been measured by brand loyalty; positive word of mouth and high repurchase intention (Recheld et al., 1996). Customers repurchase behavior is influenced by cumulative satisfaction rather than isolated episodes of satisfaction (Oliver, 1999). Loyalty is characterized by a willingness to reutilize a service despite external influences and marketing efforts that can lead to switching behavior (Oliver, 1997).

2.7 Empirical literature review

2.7.1 Service quality in healthcare

A systematic review by (Endeshaw, 2021) reviewed quality measurement models for a thirty six year period (1979-2015) with 74 studies selected for analysis. The key words for the literature search were “measurement models” SERVQUAL”, “SERVPERF” “healthcare” “service quality” “HEALTHQUAL” “PubHosQual” and “HospitalQual”. He reported lack of consensus among academics on the definition, indicators of quality in healthcare. Most tools used are of Western origin and are not sensitive to cultural and economic differences with developing countries. The measures in place are generic which may not be suitable for healthcare quality measurement. Studies in the area were considered too narrow in focusing only on functional aspects of care while disregarding technical aspects such as provider competence. They recommended that developing countries develop their own models for measuring healthcare quality. Gap-analysis however can be used healthcare compare service quality with other service industries if it did not adapt global measures of quality. The recommendation made in this analysis favours the use of a gap measurement model like SERVQUAL which this study utilized.

A systematic review was by Fatima et al. (2019) conducted to review research that has been done to measure the dimensions of healthcare service quality. Service quality was found to encompass various dimensions including technical and functional aspects and SERVQUAL as the most used model in both developing and developed countries. Despite numerous empirical and theoretical criticisms SERVQUAL remains a valuable tool for research in the area of service quality (Ladhari, 2009) and is used in this study.

A systematic review was conducted by Ahmady et al. (2015) reviewing studies published between 1980 and March 2014 to determine the satisfaction of patients when they received care at university dental hospitals. Nine articles were reviewed which met the inclusion criteria. Five dimensions included in patient satisfaction surveys were identified: cost, quality, access, interaction and environment. Establishing which dimensions are critical was found to be useful in helping academic dental hospitals to provide high quality of care. The two main tools that were identified for measuring patient satisfaction were the Dental Satisfaction Questionnaire and SERVQUAL. Most studies reviewed used the DSQ. The main limitation cited was that it can only measure patient satisfaction in dentistry. Despite its limitations SERVQUAL is widely used (Parasuraman, 1985, 1988 and its ease of modification (Cronin and Taylor, 1994) make it widely used in healthcare as a valid and reliable tool for measuring patient satisfaction. The use of

SERVQUAL in this study addresses the gap cited by Ahmady et al. (2015) to enable comparison of dental healthcare quality across service industries.

2.7.2 Patient satisfaction with service quality in healthcare

Kitapci et al (2014) conducted a cross sectional study in one of the largest public university hospitals in Turkey surveying 369 patients. The objective of their study was to determine the impact of service quality dimensions on patient satisfaction their revisit intention and word of mouth communication. They employed SERVQUAL model and found that empathy and assurance dimensions are positively related to customer satisfaction (Parasuraman et al., 1985). Word of mouth recommendation and revisit intention are highly related and are antecedents of customer satisfaction. Gap- they surveyed patients being served in all polyclinics of the university hospital. The different services offered in these clinics make it difficult to know exactly what specific sectors were being reported on.

A descriptive cross sectional survey of 318 respondents was conducted by Lee (2010) in three hospitals in Taiwan by means of customized self-administered questionnaires. The study was underpinned by the Donabedian theory of Structure process and outcome and set out to explore the relationship among service quality, service value and patient satisfaction. The results showed that medical service quality is directly influenced by customer orientation, and patient satisfaction is influenced by medical service quality. The authors established that patient satisfaction is indirectly influenced by customer centricity. The implication of this is that if providers design customer oriented service and business cultures they can differentiate themselves and thus gain a competitive advantage against other hospitals in the same sphere.

A cross-sectional study was conducted in 2014 by Pouragha and Zarei (2016) to establish the effect of outpatient service quality on patient satisfaction. The authors sampled 500 patients who were selected with systematic random method from the outpatient departments (clinics) of four teaching hospitals in Tehran. The survey tool was a 44 item questionnaire consisted of 44 items. The findings indicated that majority of patient had a positive experience in the outpatient departments of teaching hospitals. The factors that affected satisfaction were: costs, doctor consultation, physical environment and patient information. Improvement of the same factors was cited as an effective management strategy for enhancing outpatient satisfaction.

A cross sectional survey by Zohreh (2014) on 385 randomly selected patients from 3 general hospitals in Iran used a SERVQUAL questionnaire to record gap between perception and expectations as an assessment of quality. All gap scores were negative with the highest gap related to responsiveness while the lowest was related to reliability dimensions respectively. They concluded that SERVQUAL was a useful tool to measure service quality of hospital services in a developing country. The gap here is that there are multiple services offered at hospitals and it is difficult to point to which service the results are attributed to. This study addresses services that are in one specific area of dental health services.

A survey by Došen et al. (2020) on the quality of services provided by a large public university in Croatia based on the gaps model and SERVQUAL was done on 564 patients in 18 departments of the university hospital centre. Four out of five SERVQUAL dimensions was negative which means expectations exceeded perceptions, “empathy” had a positive gap score. The smallest gap was in the assurance dimension, further the key dissatisfaction areas were “responsiveness” (waiting time and patient information) and “tangibles” (physical appearance of the hospital and infrastructure). Eighteen departments were surveyed in this study and despite the sample size being large it is not clear how many patients were seen in each department and thus the findings give a very general view of the university hospital centre. This study narrows down to a specific area of service making it possible to attribute the quality gaps to that department.

A descriptive cross sectional study was conducted by Mehta (2011). Data were collected through face-to-face interviews with patients utilizing the Romanian health system based on a questionnaire. Out of 2305 people sampled, 83% had utilized the universal Romanian health system in the past twelve months with 58% of respondents reporting that they did not trust the system. The food accommodation and other facilities were perceived as being of low standards with one third of respondents reporting that they were unsatisfied or very unsatisfied with the public healthcare system. A statistically significant relationship was found between health system confidence with age and gender, similarly between overall health system perception with age and income.

A survey was done on a sample of 340 participants visiting a private healthcare facility in Malaysia using SERVQUAL. Findings indicated an overall negative gap score and a moderate negative gap score in al dimensions of SERVQUAL (Muhammad Butt & Cyril de Run, 2010). In Sunyani Regional Hospital in Ghana a survey by Harricharan (2014) on 214 patients using SERVQUAL found overall satisfaction with service quality as good. The dimensions’ reliability,

communication/interpersonal relationship, responsiveness and assurance scored negative conversely, tangibility and empathy scored positive gap scores. In the same country (Abuosi & Atinga, 2013) a survey of 250 patients in a hospital found negative gap scores (perception-expectation) in all variables and the mean gap scores were found to be statistically significant.

Amin and Nasharuddin (2013) conducted a cross sectional study in Malaysian public and private hospitals to investigate hospital service quality and its effect on patient satisfaction and behavioral intention. 216 questionnaires were completed with the results confirming the five dimensions for hospital service quality as admission process, medical service experience, overall service, discharge processes and social responsibility of the hospital. The findings of this study show that improving service quality in hospitals improves patient satisfaction and behavioral intention.

2.7.3 Patient satisfaction with service quality in University Dental Hospitals

A survey of 500 patients at Louisiana State University School of Dentistry by Lafont (1999) measured patient satisfaction with the state of facilities, services offered and treatment received at a dental school clinic. The thirty-one item questionnaire used a five point Likert format. It addressed issues such as helpfulness of staff, progress of treatment, fees, conformity to universal standards, quality, facilities, compassion and dignity. There was also a question on whether the patient would recommend the school to others for dental treatment. A vast majority of patients were satisfied with the state of the facility and the services offered. They however felt that service delivery and waiting times could be expedited.

Schiro et al. (2018) conducted a patient satisfaction survey at the University Of North Carolina School Of Dentistry (UNC-SOD) over a 90 day period. It was a conducted using a custom-made self-administered paper questionnaire consisting of 31 questions, 3 demographic and 28 five-point Likert scale items. It measured: interaction, communication, timeliness of treatment, fees, administration and transportation. Overall, the patients in the three groups studied within the school were satisfied and would recommend others to receive care. Despite the overlap among the dimensions investigated in these studies no one standardized survey instrument was employed. This was found to be true especially in patient satisfaction surveys of dental school clinics. In addition, the study at University Of North Carolina School Of Dentistry (UNC-SOD) did not address the physical environment and appearance of the staff, a gap which will be addressed in this research.

In a study done at the Lagos State University teaching hospital dental clinic in Nigeria, they evaluated five dimensions: access, interaction, quality environment, and cost. These dimensions were found to be useful in helping decision-makers collect data concerning patient satisfaction. This, in turn, can help to modify service delivery and thus meet patient expectations. The benefit of this information to administrators is to help them manage the expectations of patients and to ensure they match with the quality of services to be provided (Orenuga et al., 2009). This study utilized a customized questionnaire as recommended by Endeshaw (2021) but it makes comparison of the findings with other centers a challenge due to this lack of standardization.

A patient satisfaction study was conducted at the Lagos University Teaching Hospital dental outpatient department using a modified Dental Satisfaction Questionnaire (DSQ). It aimed to assess dental outpatient satisfaction with oral healthcare delivery in a tertiary institution. High patient satisfaction levels were related to good interpersonal skills and the quality of staff relationships with patients. There was however a need to improve on infrastructure and to provide a steady supply of water and electricity in the hospital (Adeniyi et al., 2013). This study faced the limitations cited by Ahmady et al.(2015) by using a tool that does not allow for comparison with other health sectors and underlines the limitations cited by the same authors industry specific survey tools. These limitations will be addressed in this research by using SERVQUAL which can be used across multiple service industries.

White (2001) conducted a study in a South African dental teaching hospital using a modified SERVQUAL questionnaire to measure patient expectations and perceptions of service quality. They found that 11.6% reported having some dissatisfaction with the service reliability. The levels of competency and assurance contributed to 59% of service level variance. The perception expectation gap diminished with a higher frequency of visits to the hospital. There was greater variation among female patients than males. The age subset of 36-45 years had greater mean differences than any other age group. Lower levels of education corresponded to lower expectations. Professionals also had more realistic expectations than technical people. This paper has many similarities to the proposed research which will address the gap of future patient behavior that is not discussed in this study.

2.7.4 Revisit intention

A survey was conducted on 100 patients of RS Balimed the largest private healthcare facility in Bali to investigate the effect of service quality on customer satisfaction and revisit intention. There was positive correlation between customer satisfaction and revisit intention. Assurance and empathy had positive and significant influence on patient satisfaction, tangible's reliability and responsiveness influence satisfaction but the effects were not significant. The impact of reliability assurance and empathy had an indirect but significant influence on revisit intention (Wandebori et al., 2017).

An online survey was conducted on 259 patients who visited private hospitals in the Greater Jakarta area of Indonesia. The purpose of the study was to predict revisit intention mediated by perceived service quality and patient satisfaction. They analysed brand image, word of mouth perceived service quality and satisfaction. They found that brand and word of mouth have little effect on satisfaction while trust and perceived service quality have a very high effect on satisfaction (Ayu, & Kusumawardani, 2021).

A study analysed the impact of health communication, service value, quality, patient satisfaction on the intention to revisit 10 dental clinics in Seoul Korea. 570 questionnaires were analysed. The factors influencing service quality were reliability, expertise, communication by doctors and tangibility. Further service value increases patient satisfaction which in turn influences revisit intention (Park et al., 2021).

2.7.5 Word of mouth recommendation

A comprehensive literature review of the leading scientific journals in the health sector reviewed twenty-nine WOM studies with the popularity of WOM resulting from increased competition and new forms of electronic communication within healthcare (Martin et al 2017). The focus remains primarily on patients as senders and receivers of WOM but Drevs et al. (2014) showed that other stakeholders such as relatives may also be heavily engaged in WOM. Electronic WOM is effective possibly explained by the agenda setting theory (Li et al. 2015) but there is limited comparison with conventional WOM in current literature. Stakeholder theory supports providers and payers to integrate WOM in their business processes (Pederson 2013). Some studies use recommendation as an indicator of patient satisfaction (Tajeu et al. 2015), but contrary to these other studies show that a high number of dissatisfied customers may still recommend a hospital (Cheng et al 2003).

2.8 Summary of knowledge gap

Patient satisfaction and healthcare quality have been studied in the area of oral health primarily using industry specific tools. This lack of standardization of the data collection tools makes

comparison of findings within the industry and across other sectors a challenge. This study adds to the existing body of knowledge by using SERVQUAL as a model for measuring patient satisfaction with service quality. It goes further to add aspects of customer behaviour by assessing revisit intention and word of mouth recommendation.

Table 2: Summary of Knowledge Gaps

Authors	Aim	Findings	Gaps
Lafont (1999) at Louisiana State University School of Dentistry USA	To measure patient satisfaction with the state of facilities, services offered, and treatment received at a dental school clinic	Majority of patients were satisfied with the state of the facility and the services offered. They however felt that service delivery and waiting times could be expedited.	A customized questionnaire was used and thus makes the findings of the study difficult to compare with other similar studies
Schiro et al. (2018) at Louisiana State University School of Dentistry USA	To measure: interaction, communication, timeliness of treatment, fees, administration and transportation	Overall, the patients in the three groups studied within the school were satisfied and would recommend others to receive care	No standardized survey instrument was used, and the study did not address the physical facilities or appearance of staff which are addressed in this study
(Orenuga et al., 2009) At Lagos State University teaching hospital dental clinic in Nigeria	Evaluate five dimensions: access, interaction, quality environment, and cost	These dimensions were found to be useful in helping decision-makers collect data concerning patient satisfaction	This study utilized a customized questionnaire as recommended by (Endeshaw, 2021) but it makes comparison of the findings with other centers a challenge due to this lack of standardization.
(Adeniyi et al., 2013 at the Lagos University Teaching Hospital dental outpatient	A modified Dental Satisfaction Questionnaire (DSQ) to assess dental outpatient satisfaction with oral healthcare delivery in a tertiary institution	High patient satisfaction levels were related to good interpersonal skills and the quality of staff relationships with patients. There was however a need to improve on infrastructure and to provide a steady supply of water and	The DSQ can only be used to assess patient satisfaction in the dental profession

		electricity in the hospital	
White(2001) in a South African dental teaching hospital	A modified SERVQUAL questionnaire to measure patient expectations and perceptions of service quality	They found that 11.6% reported having some dissatisfaction with the service reliability. The levels of competency and assurance contributed to 59% of service level variance	Future patient behavior as a result of satisfaction is not addressed in this study such as word of mouth recommendation and revisit intention

2.9 Conceptual framework

The conceptual framework explains the process of applying the SERVQUAL model to achieve the set-out objectives of this study. The same dimensions for measuring service quality are extrapolated to constitute overall patient satisfaction. The working assumption is that service quality precedes customer satisfaction. The model goes further to demonstrate how patient satisfaction impacts both word of mouth recommendation and revisit intention

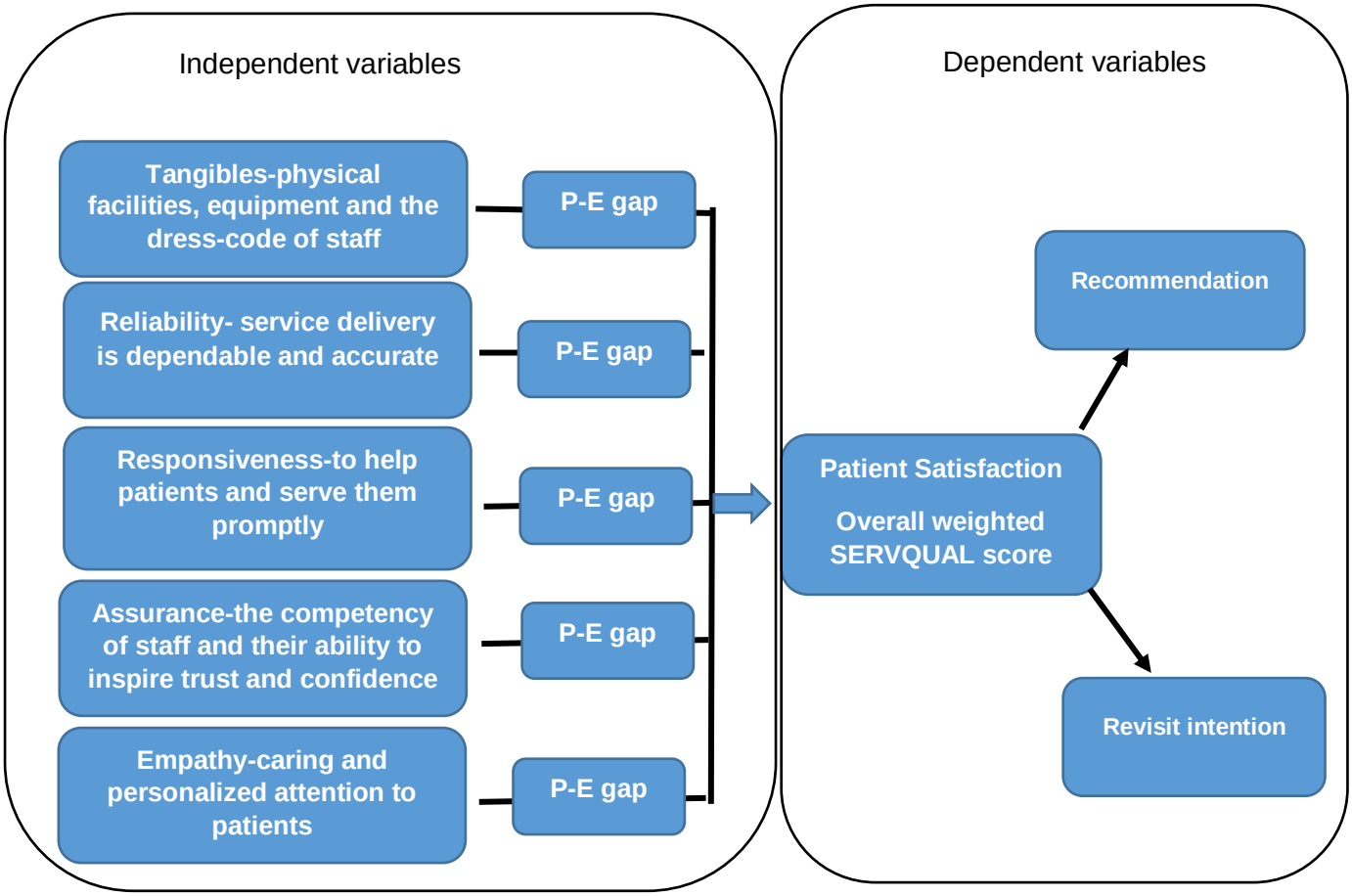


Figure 2: Conceptual framework SERVQUAL perception expectation gap score

As depicted in figure 2, patients' willingness to recommend and revisit the dental facility are the observed variables use to measure patients' satisfaction level. The gap score is the difference between perception and expectation of patients towards the statements under each factor.

According to Zeithaml et al. (1988), it is envisaged that any conceptual model in service quality enables management to identify quality problems and thus help in planning for the launch of quality improvement programs thereby improving the efficiency, profitability and overall performance. The model adopted in this study is the original gap model by Parasuraman, Zeithaml and Berry in 1985, and refined in 1988 and 1991. A summary of the gaps is given as:

Gap 1(Tangibles gap): If the tangibles gap score is positive it could mean that the sampled dental facilities are doing well in terms of physical facilities, equipment and the dress-code of staff, otherwise the tangible services are wanting.

Gap 2(Reliability gap): If the reliability gap score is positive it could mean that the sampled dental facilities are doing great in delivering services which are dependable and accurate, otherwise the service delivery requires some improvement.

Gap 3(Responsiveness gap): If the Responsiveness gap score is positive it would mean that the sampled dental facilities are doing great in helping patients and serve the patients promptly, otherwise the service delivery in terms of promptness requires improvement.

Gap 4(Assurance gap): If the assurance gap score is positive it would mean that the sampled dental facilities are doing commendable job that reflects the high level of competence among staffs, otherwise the service delivery needs an improvement to include in assurance.

Gap 5(Empathy gap): If the empathy gap score is positive it would mean that the sampled dental facilities are doing commendable job that reflects the high level of caring and personalized attention patients, otherwise the service delivery needs an improvement to include in empathy feeling.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section describes the study design used in the study as well as the sampling method and data collection tools. It describes the data analysis methods that were used, and the measures put in place to ensure the data analyzed were valid and reliable. The ethical considerations of the study are also highlighted.

3.2 Research design

The study was a descriptive cross-sectional survey of patients seeking services at the dental hospitals of the University of Nairobi and Moi University outpatient clinics in Kenya. A cross-sectional design entails studying the proportion of population, assumed to be the representative of the population, at one point of time or short time (Lev, 2006). The patients were only contacted within the study period and enquired on the questions pertaining the study. The design was deemed fit for the study because it takes little time, it is inexpensive in nature and its common application in the health planning sphere (Hemed, 2015).

3.3 Study population

The study population comprised 388 patients surveyed before and after receiving services at University of Nairobi School of Dental Sciences and Moi University School of Dentistry during the study period. These are the only University Dental Hospitals in the Republic of Kenya (Kenya National Oral Health Survey Report, 2015) and that is why they were both included the study targeted public university dental hospitals in Kenya. These are the largest outpatient dental facilities in Kenya in terms of infrastructure, human resource capacity and reach. The reason for selecting these institutions other than their scale is the fact that they are both run by the central government under the Ministry of Education. Their financing and operations are similar in many ways. They also have the highest number of dental professionals employed and they offer the full range of dental services with all specialties represented (KNOHS, 2015).

Studying other outpatient dental clinics run by respective county governments was ruled out as counties have different models of financing and operations. Similar variability in finance, human resource and operations led to the exclusion of private dental clinics as suitable populations to conduct this survey. It was found to be financially and technically feasible to include both institutions in our study based on the criteria and objectives of my research.

3.4 Sampling design

Population size (for a finite population we apply a correction factor (N): 1,000,000

Hypothesized percentage frequency of outcome in the population (p): 50%+/- 5

Confidence limits as a percentage of 100 (an absolute +/- %) (d): 5%

Design effect (for cluster surveys-DEFF): 1

Formula: sample size n= $[DEFF*Np(1-p)]/ [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$

Confidence level (%)	Sample Size
95%	384
80%	165
90%	271
97%	471
99%	664
99.9%	1082
99.99%	1512

Results from OpenEpi, Version 3, open source calculator--SSPropor

The population size was set at one million because it was a survey comprising a large population. The anticipated frequency of patient satisfaction levels in Kenyan university dental hospitals was unknown so I left the hypothesized frequency of outcome factor in the population at 50%. The confidence level as a percentage was 5%. The design effect was 1.0 for a random sample. Based on these assumptions and applying the above formula the sample size (at 95% confidence interval) for this survey was set as 384.

3.4.1 Sampling procedure

Convenient sampling was used to select the participants included in the study. Convenience sampling is a non-probability sampling technique in which the investigator enrolls subjects according to their accessibility and availability. Its name is descriptive as it entails selecting the elements according to their convenient proximity and accessibility. The convenient sampling is quick, inexpensive, easy, saves on time and is an accessible method (Elfil & Negida, 2017), forming the basis of why it was deployed in the study. The study population was patients who sought services at the outpatient dental department of the respective institutions under study within the study period.

3.5 Inclusion criteria

The study included persons who were over the age of eighteen, those who were able to give informed consent and were visiting the outpatient clinics in the study area for treatment within the study period.

3.6 Exclusion criteria

The study excluded any persons who were unable to give informed consent and those who declined to be interviewed.

3.7 Participant selection

Participants were selected by convenience sampling. Patients who presented in the respective study areas and met the inclusion criteria were included in the survey.

3.8 Risk/ benefit analysis

There were no known anticipated risks of taking part in the survey. It involved participants responding to a guided questionnaire. The postulated benefit of the current study was to provide patient centered feedback about service quality. This feedback would be useful in helping the management of public university dental hospitals and similar institutions to improve service delivery. It would also help them to assess their performance by comparing the findings to existing quality improvement programs and to benchmark against similar institutions.

3.8 Survey data collection

All data were collected from patients visiting the outpatient clinics at The University of Nairobi and Moi University dental hospitals within the study period. The questionnaire was pilot tested on five patients to verify its validity and reliability. The patients who presented for treatment at the respective dental clinics were asked if they were willing to participate in the study. Upon signing the consent form the questionnaire was administered face to face using a coded digital survey tool (Open Data Kit) on a smart phone by a calibrated research assistant. ODK is a set of open source applications which allow one to create a questionnaire form in the Xform format, fill it out on a mobile phone or tablet running the Android operating system, store and view the aggregated information on a central server, and retrieve the aggregated data to one's computer for analysis, the Open Data Kit was preferred in the study because of its control features that enables quality data collection.

The SERVQUAL tool is a formal standardized questionnaire which has prescribed wording, definitions and response format. It was agreed with my supervisor due to the inherent technical nature of the SERVQUAL questionnaire it was best for it to be administered as a guided

questionnaire. This was an advantage also because the Covid-19 pandemic broke out soon after data collection started, and thus self-administered questionnaires were ruled out. The digital format and use of a research assistant made compliance with social distancing and wearing of masks during the interview possible.

The questionnaire comprised of two sections. The first section captured the socio-demographic data of the respondents comprising the name, gender, age, monthly income, and level of education. The second section consisted of the SERVQUAL tool which measured the service dimensions of quality (tangibles, reliability, responsiveness, assurance, and empathy). The final section had questions on customer revisit intention and their willingness to recommend the services to others. The responses were recorded on a 7-point Likert scale as 1 for "strongly disagree" up to 7 for "strongly agree". The original Likert scale is a set of statements (items) offered for a real or hypothetical situation under study. Participants are asked to show their level of agreement (from strongly disagree to strongly agree) with the given statement (items) on a metric scale (Albaum, 1997).

The patient expectations were recorded in the five dimensions of SERVQUAL (tangibles, reliability, responsiveness, assurance and empathy). After receiving the dental service, the research assistant recorded their perceptions in the five dimensions of SERVQUAL (tangibles, reliability, responsiveness, assurance and empathy). The questionnaire for measuring service quality using SERVQUAL was sourced from Parasuraman et al. (2009).

Steps to compute the unweighted SERVQUAL score

Step 1: Obtain a score for the 22 patient expectation questions, next obtain a score for each patient perception question. Calculate the gap score for each of the statements.

Gap score= [Perception-Expectation]

Step 2: Obtain the mean gap score for each dimension (tangible, reliability, responsiveness, assurance, empathy). This is by totaling the gap scores and dividing this score by the number of statements measuring the dimension.

Step 3: Transfer the average dimension SERVQUAL scores for all five dimensions to a table (appendix 3), sum up the scores and divide it by 5 to obtain the unweighted measure of service quality

Steps to obtain the weighted SERVQUAL score

Step 1: Obtain the importance weights for each of the five dimensions. The importance weights total to 100 and the measure how important each of the features (tangible, reliability, responsiveness, assurance, empathy) are to the patient

Step 2: multiply the average score for each dimension with its importance weight

Step 3: add the weighted SERVQUAL scores to get the overall weighted SERVQUAL score

3.9 Research quality

A single research assistant was recruited for the entire study, he was a Kenyan national with a good background in social science research. He was proficient in both English and Kiswahili which were the two languages the questionnaire was translated into. He was trained over several meetings to understand the survey tool and the objectives of the research. The training exercise included translation of key words in the questionnaire into Kiswahili. The research assistant was calibrated by taking part in the pilot testing of the questionnaires on five patients.

Validity describes how precisely a given research instrument measures a given study phenomenon (Cooper et al., 2008). This study used content validity to ascertain the validity of the questionnaire used in the study. The questionnaire was based on the review of similar previous studies and a seven -point Likert scale was used by giving choices as 1 for “strongly disagree” up to 7 for “strongly agree”. Content validity testing was established through consultations with thesis supervisors and experts to determine its practicality as well as the appropriateness of the questionnaire to achieve the study objectives.

Reliability describes the ability of a research instrument to yield consistent results when applied to the same population repeatedly (Mugenda, 2003). Cronbach’s Alfa test of internal consistency was used with a threshold of reliability set at 0.7. The questionnaire was pilot tested on five patients and outcomes discussed. This was to confirm the ease of understanding of the questions and correct wording of the questions. The results of the pilot study were used to test the reliability at the set cut off point and they were found to be greater than 0.7 (Quinlan et al., 2015) thus concluding that the research questionnaire was reliable.

3.10 Data analysis

The process of data analysis involved cleaning, classification and tabulation of the collected data. The collected data from Open Data Kit (ODK) was exported into Microsoft Excel ® spreadsheets and analysed using the same software as well as IBM-SPSS (statistical package for social services). A descriptive analysis of percentages, proportions, mean, mode median and standard deviation was done to examine the differences in service quality perception and satisfaction by

age, gender, education level, and occupation. The factor analysis technique with iterated principal factor method was used to reduce items of service quality dimensions into their constructs, after validity and reliability tests were performed on the items.

Due to metric nature of study outcome (satisfaction level), the multiple regressions analysis was employed to ascertain how services satisfaction of patients was influenced with the five service quality dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The following equation model was fitted to achieve the study objectives:

Y (Satisfaction) = β0 + β1 (tangibles) + β2 (reliability) + β3 (responsiveness) + β4 (assurance) + β5 (empathy)

Where, β_i (i=0, 1….5) are the model coefficients.

3.11 Ethical clearance & approval

Ethical approval was obtained from Strathmore University Institutional Research and Ethics Committee (SU-IERC) and registered by NACOSTI under license number **NACOSTI/P/20/4396**. Permission to conduct the survey was granted by the respective deans of Moi University and the University of Nairobi Dental Schools. Participants were informed beforehand what the objectives of the study were as well as the risks and benefits. Collection of data proceeded after assent and consent was obtained from all participants who volunteered to take part in the study. Participants were informed that they could wilfully decline to take part in the study at any point. The participants were guaranteed that the data collected was handled with utmost confidentiality and posed no risk of a data privacy breach.

3.12 Dissemination plan

The results of this research will be presented as a prerequisite for the award of a degree MBA-HCM at Strathmore University business school. The findings will also be disseminated by publication in a relevant peer reviewed journal. The findings will be presented in suitable forums where key stakeholders are present will also be pursued such as seminars and conferences. A summary of the research findings will also be shared with the deans and management of the participating universities. An executive summary with the management implications of the findings will also be shared with the schools for the purpose of strategic planning and change management.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents the findings of the modified SERVQUAL survey which was conducted on a total of 388 dental patients at University of Nairobi and Moi University dental hospitals. The first section describes the data collected by socio-demographic subgroups such as age, gender, education level and income level. The second section presents the aggregate scores of individual SERVQUAL measures and the overall weighted score in the sampled population. The last section highlights the revisit intention of patients and their willingness to recommend the services to other patients.

4.0.1 Socio-demographic profiling of respondents

The responses used in the study were drawn from 388 patients who met the inclusion criteria and completed the questionnaire at the University of Nairobi and Moi University dental hospitals during the study period. The gender distribution was 53.87% female and 46.13% male (see figure 3).

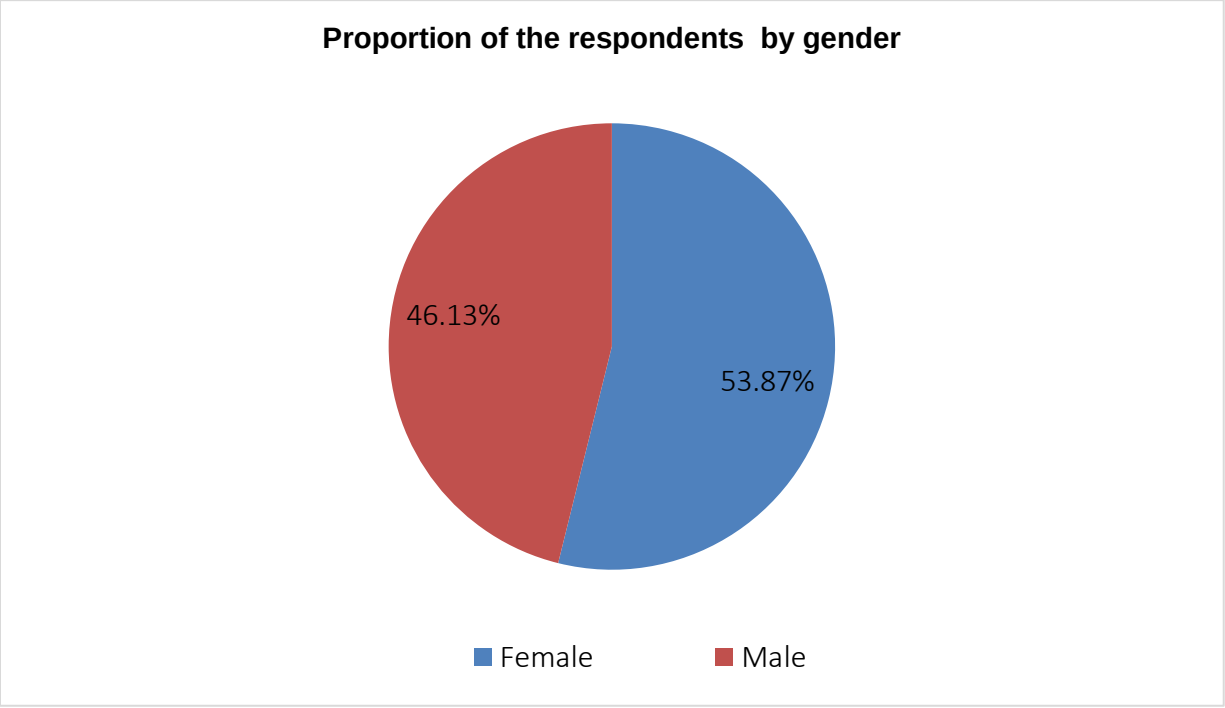


Figure 3: Proportion of the respondents by gender

The education level attainment of participants was analyzed and showed 57% of respondents had attained university level education at the time of the study, followed by secondary level 30%, primary level 9% and only 5% had a pre-primary level of education. Disaggregation by gender shows that more females 59% compared to males 54% had attained university level of education at the time of the study (figure 4).

Further analysis was done to ascertain whether the level of education attained had any significant association with the gender of the respondent, the result from Chi-square test of association showed evidence of no association between the two variables at 5% level of significance (Pearson chi2(3) = 1.8268 P= 0.609). Cumulatively, 87% of the respondents had obtained secondary or university level of education at the time of the study.

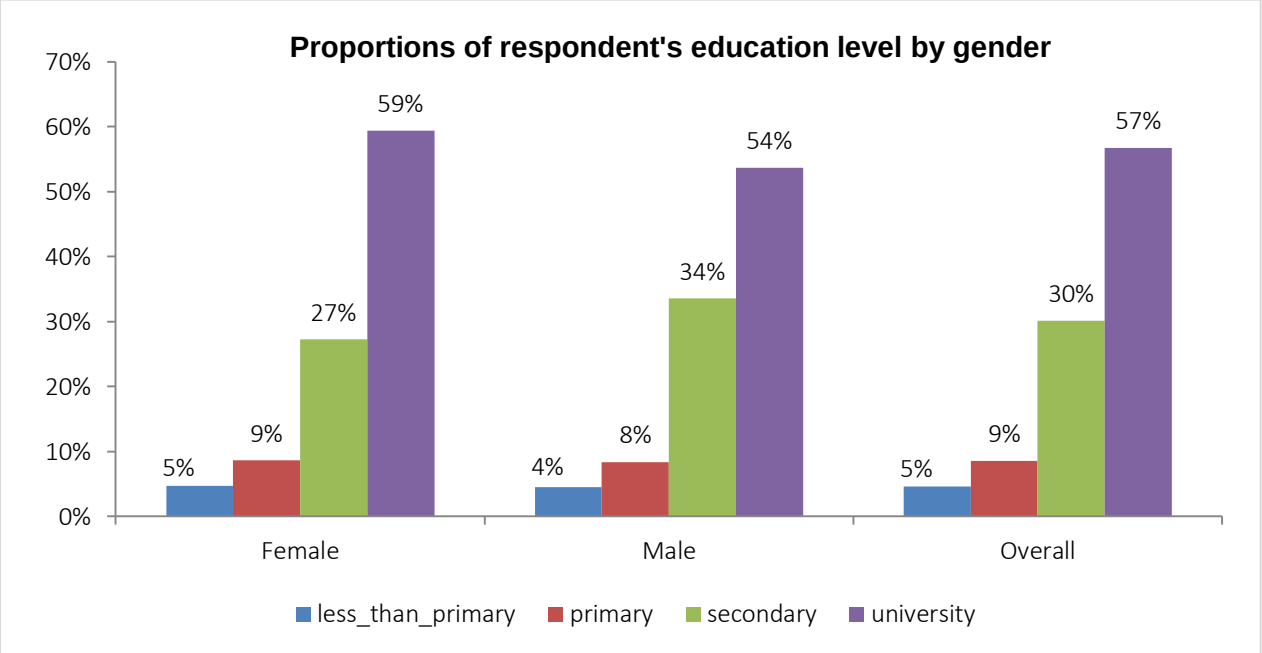


Figure 4: Proportions of respondent's education level by gender (survey, 2020)

With respect to the respondent's age group, 28% were in the 35-40 years age category, 24% were in the 26-34 years category. 21% of respondents were in the 18-25 years category and 51-64 years age group respectively. 5% of the respondents were of the 65 years and above age group (figure 4.3). The Chi-square test of association revealed an insignificant association between age group and gender (Pearson chi2 (4) = 6.4501 P= 0.168).

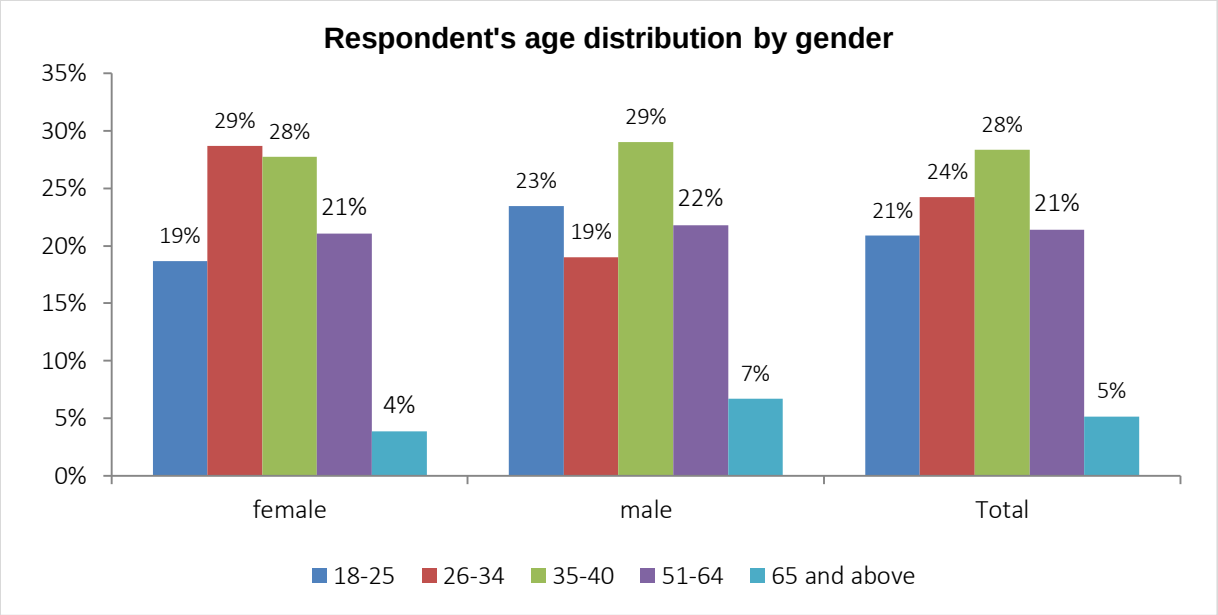


Figure 5: Respondent's age distribution by gender (survey, 2021)

Forty five percent (45 %) of the respondents had no monthly income at the time of the study. Among those respondents with a monthly income, 46% of them earned between KES. 12,000 and KES. 47,000 and only 10% had a monthly income of more than KES. 47,000.

4.0.2. Analysis of the SERVQUAL expectations and perception items

SERVQUAL is a quality evaluation tool comprising twenty-two questions in five subsets namely, tangibles, reliability, responsiveness, assurance, and empathy that measure the gap between customer expectation and their perception to indicate quality. The five dimensions were measured in the questionnaire using 7-point Likert scale where 1 represented strong disagreement with the statement and 7 represented strong agreement with the statement.

4.0.2.1 Tangibles services descriptive statistics summaries

Table 3: Descriptive results of tangibles measurements scales

	Items	Obs.	Mean	SD
Expectations				
E1	Excellent U.H dental clinics will have modern- looking equipment.	388	6.113	1.236
E2	The physical facilities at excellent U.H dental clinics will be visually appealing.	388	6.121	1.211
E3	Employees at excellent U.H dental clinics will be neat.	388	6.320	1.086
E4	Materials associated with the service (such as pamphlets or statements) will be visually appealing.	388	6.222	1.138

Perceptions				
P1	This U.H dental clinic has modern-looking equipment.	388	6.168	1.155
P2	This U.H dental clinic's physical facilities are visually appealing.	388	6.134	1.072
P3	This U.H dental clinic's reception desk employees are neat appearing.	388	6.281	1.081
P4	Materials associated with the service (such as pamphlets or statements) are visually appealing at this U.H dental clinic.	388	6.255	1.051

SERVQUAL Study results, 2021

The table 3 indicates the respondents' expectation and perception on tangible services. From the results, the mean score of expectation of tangibles ranges from 6.113 to 6.320. The item with the highest expectation mean score (Mean=6.320, SD=1.086) was: *"…Employees at excellent U.H dental clinics will be neat appearing"* while the item with lowest expectation mean score (mean=6.113, SD=1.236) was *"…Excellent U.H dental clinics will have modern-looking equipment".* The perception mean score ranged from 6.281 to 6.134. The item with the highest mean score (Mean=6.281, SD=1.081) was *"…This U.H dental clinic's reception desk are virtually appealing",* while the perception item with the lowest mean score (Mean=6.134, SD=1.072) was "…*This U.H dental clinic's physical facilities are visually appealing".* This mean score (mean=6.134) implies that most of the respondents were in agreement to a greater extent with a perception that U.H dental clinic's reception desk employees are neat appearing.

Table 4: Descriptive statistic of tangibles dimension/ items gap scores

Tangible GAP mean score					
Gaps	N	Mean	SD	Skewness	Kurtosis
P1-E1	388	0.054	1.327	0.272	7.606
P2-E2	388	0.013	1.212	0.951	8.840
P3-E3	388	-0.039	1.169	-0.022	10.430
P4-E4	388	0.034	1.060	0.625	10.301
Overall weighted score					**0.637**

SERVQUAL Study results, 2021

The **table 4** indicates the gap scores for the tangible's services, the dimension obtained an overall weighted score of 0.637. The positive value indicates the perception scores of respondents on the tangible component of services quality were higher than their expectation scores. On assessing individual items, the statement "*Employees at excellent U.H dental clinics will be neat"* had a negative gap score, that is the expectation is lower than the perception of the patients, the negative gap score (mean= -0.0390, SD =1.169) (**see table 4).** Overall, the perception score of

items was higher than the aggregated score of expectation items, this implies that the dental facilities, University and Nairobi and Moi University are not doing poorly in regard to tangible aspects of service delivery. The negative gap scores in item 3 on neatness of employees at excellent U.H dental clinics implies a need for improvement in terms of neatness of employees at U.H dental clinics at University and Nairobi and Moi University.

4.0.2.2 Reliability dimensions descriptive statistics summaries

Table 5: Descriptive statistics of reliability dimensions

Dimensions	N	Mean	SD
Expectations			
E1. When excellent U.H dental clinics promise to do something by a certain time, they do.	388	5.925	1.384
E2. When a customer has a problem, excellent U.H dental clinics will show a sincere interest in solving it	388	6.446	0.926
E3. Excellent U.H dental clinics will perform the service right the first time	388	6.198	1.243
E4. Excellent U.H dental clinics will provide the service at the time they promise to do so	388	6.247	1.199
E5. Excellent U.H dental clinics will insist on error- free records	388	6.180	1.275
Perceptions			
P1. When U.H dental clinics promise to do something by a certain time, it does so	388	6.188	1.206
P2. When you have a problem U.H dental clinic staff show a sincere interest in solving it.	388	6.420	0.981
P3. U.H dental clinics perform the service right the first time.	388	6.224	1.176
P4. U.H dental clinics provide their service at the time it promises to do so.	388	6.369	1.135
P5. Dental clinic insists on error-free records	388	6.284	1.151

Source: SERVQUAL Study results, 2021

The **table 5** shows the summary statistics of reliability dimensions/items. Reliability expectation approval score ranges from 5.925 to 6.446. The expectation item with the highest mean score was, *"…When a customer has a problem, excellent U.H dental clinics will show a sincere interest in solving it"*, while *"…When excellent U.H dental clinics promise to do something by a certain time, they do*" recorded the lowest mean score on the expectations group.

On the perceptions, the mean scores ranged from 6.188 to 6.420, the respondents largely agreed that *"…When you have a problem U.H dental clinic staff show a sincere interest in solving it",* followed by the perception that *"…U.H dental clinics provide their service at the time it promises to do so".* The perception with the lowest mean score (mean=6.188,

SD=1.206) was *"…When U.H dental clinics promise to do something by a certain time, it does so".*

Table 6: Descriptive statistic of reliability dimension/ items gap scores

Gap Scores	N	Mean	SD	Skewness	kurtosis
P1-E1	388	0.263	1.106	1.293	10.126
P2-E2	388	-0.026	0.835	-1.179	11.655
P3-E3	388	0.026	1.111	-0.085	8.018
P4-E4	388	0.121	1.156	0.767	11.645
P5-E5	388	0.103	0.986	1.577	11.324
Overall score					**1.856**

Source: SERVQUAL Study results calculations, 2021

Overall, the reliability dimension recorded average gap score of 1.856, this positive gap score indicates that perception scores exceeded expectation scores on the reliability component of service quality. On assessing individual items, the statement "when you have a problem U.H dental clinic staff show a sincere interest in solving it" had a negative score, that is, the expectation score is lower than the perceptions of the customers, the negative gap score (mean= -0.026, SD=0.835, this negative finding on item 2 points out the gap that should be bridged by the U.H dental clinics' employees by showing interest when solving patients' problem because the negative indicates they fell short of interest needed by patients.

4.0.2.3 Responsiveness dimensions descriptive statistics summaries

Table 7: Descriptive statistics of responsiveness dimensions

Responsiveness	N	mean	SD
Expectations			
E1. Employees of excellent U.H dental clinics will tell customers exactly when services will be performed	388	6.175	1.148
E2. Employees of excellent U.H dental clinics will give prompt service to customers.	388	6.242	1.110
E3. Employees of excellent U.H dental clinics will always be willing to help customers.	388	6.454	0.875
E4. Employees of excellent U.H dental clinics will never be too busy to respond to customers' requests.	388	6.271	1.201

Perceptions			
P1. Employees in a U.H dental clinic tell you exactly when services will be performed.	388	6.240	1.147
P2. Employees in a dental clinic give you prompt service.	388	6.240	1.189
P3. Employees in U.H dental clinics are always willing to help you.	388	6.441	1.019
P4. Employees in U.H dental clinic are never too busy to respond to your request	388	6.276	1.271

Source: SERVQUAL Study results, 2021

The **table 7** presents the summary statistics of responsiveness dimensions involving means, standard deviation, skewness, and kurtosis. The mean scores of expectations of the component of responsiveness ranges from 6.175 to 6.454. The statement *"…Employees of excellent U.H dental clinics will always be willing to help customers"* had the highest expectation mean score (Mean=6.454, SD=0.875), whereas the expression *"…Employees of excellent U.H dental clinics will tell customers exactly when services will be performed"* recorded the lowest expectation score of 6.175 (SD=1.148).

In regards to perception, the statement *"…Employees in U.H dental clinics are always willing to help you"* recorded the highest mean score of 6.441 (SD=1.019), while the expressions *"…Employees in a dental clinic give you prompt service"* and *"…Employees in a U.H dental clinic tell you exactly when services will be performed" each* had a mean score of 6.240 with standard deviation of 1.189 and 1.147 respectively.

Table 8: Descriptive summary of responsiveness dimension/ items gap scores

Gap Scores	N	Mean	SD	skewness	kurtosis
P1-E1	388	-0.064	1.026	-0.690	11.570
P2-E2	388	-0.003	0.941	-0.274	12.012
P3-E3	388	-0.013	0.846	-1.386	11.575
P4-E4	388	0.005	1.074	0.303	12.217
Overall gap Scores					**-0.261**

Source: SERVQUAL Study results, 2021

The responsiveness of the U.H dental clinics capability was further assessed, and their gap score presented in **table 8**. From the presentation, responsiveness had an overall average gap score of -0.261. The specific statement*s with negative gap scores were: "…Employees in a dental clinic give you prompt service" (mean = -0.003, SD= 0.941)* and *"…Employees in U.H dental clinics are always willing to help you" (mean= -0.013, SD= 0.846).* The overall average

gap score in responsiveness in the facilities implies an existence of urgent gap that should be bridged by the employees in University of Nairobi and Moi University dental clinics, by improving their responsiveness in providing timely, prompt services and showing willingness when offering their services.

4.0.2.4: Assurance dimensions descriptive statistics summaries

Table 9: Descriptive statistics of assurance dimensions

	N	Mean	SD
Expectations			
E1. The behaviour of employees in excellent U.H dental clinics will instil confidence in customers	388	6.170	1.173
E2. Customers of excellent U.H dental clinics will feel safe in transactions	388	6.423	0.968
E3. Employees of excellent U.H dental clinics will be consistently courteous with customers	388	6.358	1.038
E4. Employees of excellent U.H dental clinics will have the knowledge to answer customers' questions.	388	6.397	1.028
Perceptions			
P1. The behaviour of employees in a dental clinic instils confidence in you	388	6.361	1.036
P2. You feel safe in your transactions with U.H dental clinics	388	6.420	0.944
P3. Employees in the dental clinic area were consistently courteous with you	388	6.479	0.974
P4. Employees in the dental clinic had the knowledge to answer your questions	388	6.456	0.975

Source: SERVQUAL Study results, 2021

The **table 9** presents the summary statistics for the assurance dimension of service quality. The mean scores for expectation range from 6.170 to 6.423. The statement with the highest mean score (mean=6.423, SD=0.968) was *"…Customers of excellent U.H dental clinics will feel safe in transactions"*, while the statement with the lowest mean score was *"…The behaviour of employees in excellent U.H dental clinics will instil confidence in customers".*

Perception statements mean scores ranged from 6.361 to 6.479. The perception statement with the highest mean score was "*…Employees in the dental clinic area were consistently courteous with you" (mean=6.479, SD=0.974)*. The statement with lowest mean score was *"…The behaviour of employees in a dental clinic instils confidence in you" (mean=6.361, SD=1.036)*.

Table 10: Descriptive summary of assurance dimension/ items gap scores

Gap score	N	Mean	SD	skewness	kurtosis
P1-E1	388	0.191	1.009	1.366	11.954
P2-E2	388	-0.003	0.827	0.991	12.615
P3-E3	388	0.121	0.931	1.606	15.809

P4-E4	388	0.059	0.969	0.734	12.700
Overall					**0.369**

Source: SERVQUAL Study results, 2021

The **table 10** presents the mean gap score of the assurance dimension of service quality. The overall mean gap score was 0.369. All the mean gap scores were positive except *"…Customers of excellent U.H dental clinics will feel safe in transactions"* having a mean gap score of -0.003, SD 0.827. The overall positive assurance means score implies that the U.H dental clinics' employees are generally performing well according to the patients regarding assurance. The service quality gap to be filled was only evident on safety when transacting with the employees.

4.0.2.5: Empathy dimensions descriptive statistics summaries

Table 11: Descriptive statistics of empathy dimensions

	N	Mean	SD
Expectation			
E1. Excellent U.H dental clinics will give customers individual attention	388	6.294	1.030
E2. Excellent U.H dental clinics will have operating hours convenient to all their customers	388	6.235	1.170
E3. Excellent U.H dental clinics will have employees who give customers personal attention	388	6.399	0.998
E4. Excellent U.H dental clinics will have their customer's best interests at heart	388	6.387	1.032
E5. The employees of excellent U.H dental clinics will understand the specific needs of their customers	388	6.436	0.993
Perception			
P1. U.H dental clinic gives you individual attention	388	6.358	1.005
P2. U.H dental clinic has operating hours convenient to all its customers	388	6.131	1.286
P3. U.H dental clinic has employees who give you personal attention	388	6.351	1.084
P4. U.H dental clinic has your best interest at heart	388	6.415	1.035
P5. The employees of the U.H dental clinic understand your specific needs	388	6.410	1.034

Source: SERVQUAL Study results, 2021

The **table 11** shows the descriptive summary of empathy items. On the expectations, the statement with highest mean score was *"…The employees of excellent U.H dental clinics will understand the specific needs of their customers" (6.436, SD=0.993), w*hile the statement with the lowest mean was *"…Excellent U.H dental clinics will have operating hours convenient to all their customers" (6.235, SD=1.170).*

The mean scores for perception items range from 6.131 to 6.415. The statement having the highest mean score (Mean=6.415, SD=1.035) was *"…U.H dental clinic has your best interest at*

heart", while the lowest mean score (Mean=6.131, SD=1.286) was recorded by the statement that reads *"…U.H dental clinic has operating hours convenient to all its customers".*

Table 12: Descriptive summary of empathy dimension/ items gap scores

	N	Mean	SD	skewness	Kurtosis
P1-E1	388	0.064	0.891	0.005	7.740
P2-E2	388	-0.103	1.141	-0.926	9.268
P3-E3	388	-0.049	0.797	-0.647	6.322
P4-E4	388	0.028	0.858	0.733	11.601
P5-E5	388	-0.026	0.964	-0.486	11.564
Overall					**-0.085**

Source: SERVQUAL Study results, 2021

The empathy dimension had an overall gap score of -0.085, implying that the overall customer's expectation score was higher than the overall perception score. The statements that recorded a negative mean gap score were "…*U.H dental clinics will have operating hours convenient to all their customers"* (Mean= -0.103, SD=1.141), "…*U.H dental clinics will have employees who give customers personal attention"* (Mean= -0.049, SD=0.797), and "…*employees of excellent U.H dental clinics understand the specific needs of their customers"* (Mean= -0.026, SD=0.964). The overall negative mean score of empathy dimensions implies that there is still a gap to bre filled by the U.H clinics employees regarding the empathy level they show their customers when offering the services.

4.0.3 Factor Analysis of SERQUAL dimensions

As aforementioned in the methodology section, factor analysis was employed to reduce the items under each SERQUAL dimension to approximate one factor that is more correlated with the items to serve as the construct of the dimensions. A factor analysis is a multivariate technique used in reducing set of factors or items to a single construct (Pett et al., 2003). Before proceeding to the factor analysis, the validity and reliability tests were done to confirm that the requirements are met as was proposed by Heir et al. (2010).

4.0.3.1 Tangibles measurement scale validity and reliability tests

Preceding the factor analysis was validity and reliability tests using the Cronbach's alpha statistic as shown in table A1 in appendix section, the overall Cronbach's alpha estimate for the 8 items is 0.864 which surpasses the threshold of 0.7 (Zikmund & Babin, 2010), therefore, all the items were kept and used in the factor analysis stage. The overall Kaiser-Meyer-Olkin measure of sampling adequacy for the seven items of U.H tangible was 0.865, this value passes the threshold

recommended by Kaiser (1974). The Bartlett test of sphericity revealed a significant chi-square value of 1223.002 (p=0.000, df=28), this implies that the items were inter-correlated with each other (**see table 13**).

Table 13: KMO and Bartlett's Test for tangibles Measurement Scale Items

Determinant of the correlation matrix	
Determinant	0.041
Bartlett test of sphericity	
Chi-square	1223.002
Degrees of freedom	28
p-value	0.000
H0: variables are not intercorrelated	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.865

Source: SERVQUAL Study results, 2021

After the reliability and validity test, the study used the factor analysis to approximate the tangible scores of the hospitals using an iterated principal factors (IPF) method, together with the weighted scores of its seven items. At the factor analysis stage, only factor one was retained to predict tangible score, as it has an eigenvalue greater that one as recommended by Cliff (1988). (**See figure 4.0.3.1**).

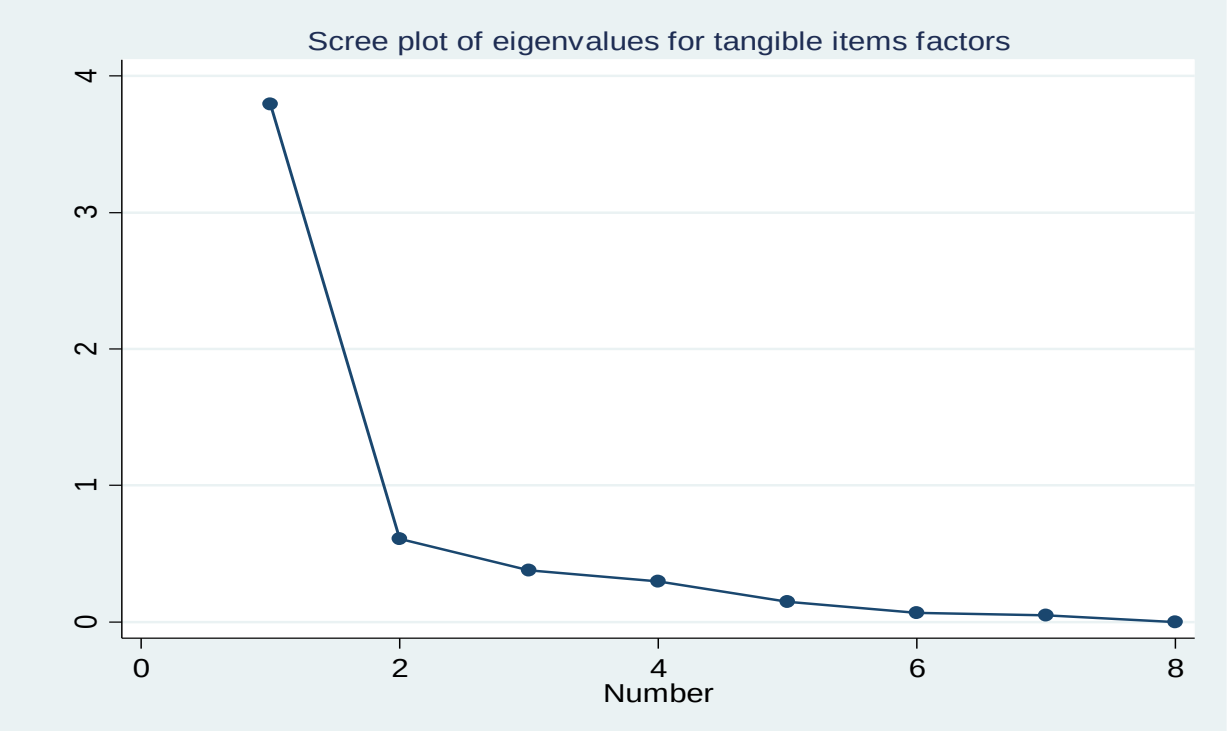


Figure 4.0.3.1: Scree plot of eigenvalues for tangible

The Bartlet's prediction method was used to predict tangible score. Table **14** presents the factor loadings for seven tangible scale items, most of the items loads highly on factor one compared to other factors. Of the items, physical appeal of the facilities loads the most (0.749) onto factor one compared to other factors, that is, it explains most of the variability in tangible perception of customers' satisfaction with the U.H dental facilities, followed by the visual appeal of materials associated with the facilities (such as pamphlets of statements) and modernity of equipment in the facilities. For further analysis factor one was used as the tangible scale score and used in regression stage.

Table 14: Factor loadings (pattern matrix) and unique variances for tangible scale items

Variable	Fac 1	Fac2	Fac3	Fac4	Fac 5	Uniquenes s
E1. Excellent U.H dental clinics will have modern looking equipment.	0.67	0.40	-0.16	0.07	0.06	0.34
E2. The physical facilities at excellent U.H dental clinics will be visually appealing.	0.69	0.35	-0.23	0.09	0.07	0.32
E3. Employees at excellent U.H dental clinics will be neat appearing.	0.64	0.19	0.39	0.09	-0.15	0.38
E4. Materials associated with the service (such as pamphlets or statements) will be visually appealing at an excellent U.H dental clinics.	0.73	0.13	0.23	-0.33	0.01	0.27
P1. This U.H dental clinic has modern looking equipment.	0.69	-0.23	-0.23	-0.11	-0.15	0.36
P2. This U.H dental clinic's physical facilities are visually appealing.	0.75	-0.26	-0.14	0.04	-0.17	0.30
P3. This U.H dental clinic's reception desk employees are neat appearing.	0.61	-0.25	0.16	0.37	0.09	0.39
P4. Materials associated with the service (such as pamphlets or statements) are visually appealing at this U.H dental clinic.	0.72	-0.31	0.02	-0.15	0.25	0.31

Source: SERVQUAL Study results, 2021

4.0.4.1 Reliability measurement scale/items validity and reliability tests

Similarly, reliability items were subjected to reliability test to assess the internal consistency using Cronbach's test of reliability, ten items produce overall Cronbach's alpha (α) of 0.905 (see table A1 in appendix section), and each item had alpha which way above the accepted cut-off level of 0.30 for item-total correlations for retention of an item in the designated factor l. Therefore, all the reliability items were retained to the next stage of analysis process where their validity was assessed using Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) tests. Based on

table **15** below, the Bartlett test of sphericity shows a significant value of Chi-square of 2029.40 (P=0.000, df=45), implying that the items are inter-correlated with each other, which is a favourable requirement for factor analysis. On the other hand, Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0.907 which is far above the required threshold suggested by Hutcheson and Sofroniou (1999).

Table 15: KMO and Bartlett's Test for reliability Measurement Scale Items

Determinant of the correlation matrix	
Determinant	0.005
Bartlett test of sphericity	
Chi-square	2029.402
Degrees of freedom	45
p-value	0.000
H0: variables are not intercorrelated	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.907

Source: SERVQUAL Study results, 2021

And therefore, all the 10 reliability items proceeded to the next process of factor analysis, using the iterated principal factors method. From the factor analysis only one factor was evident to have had an eigenvalue greater than 1 as proposed by Gorsuch (1990). (**see figure 4.0.3.2 below**).

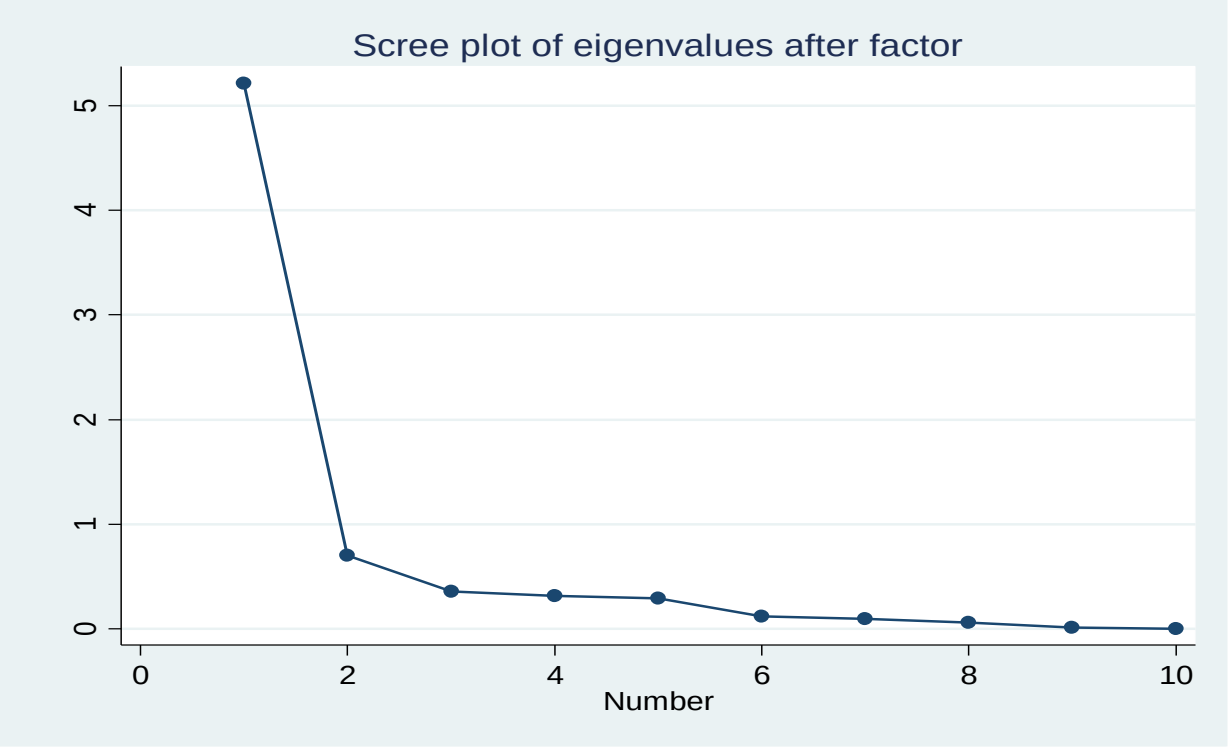


Figure 4.0.3.2: Scree plot of eigenvalues for reliability

Table 16: Factor loadings (pattern matrix) and unique variances for reliability scale items

Variable	Fac1	Fac2	Fac3	Fac4	Fac5	Fac6	Fac7	Fac8	Fac9	Uniqueness
E5. When excellent U.H dental clinics promise to do something by a certain time, they do.	0.75	-0.23	-0.16	0.12	-0.12	-0.18	-0.14	0.04	0.01	0.27
E6. When a customer has a problem, excellent U.H dental clinics will show a sincere interest in solving it.	0.73	-0.06	-0.16	-0.09	0.39	0.04	0.03	-0.07	0.01	0.27
E7. Excellent U.H dental clinics will perform the service right the first time.	0.65	-0.32	0.28	0.20	0.15	-0.06	0.02	-0.01	-0.06	0.32
E8. Excellent U.H dental clinics will provide the service at the time they promise to do so.	0.64	-0.20	-0.16	0.21	0.03	0.15	0.07	0.11	0.04	0.45
E9. Excellent U.H dental clinics will insist on error free records	0.67	0.48	-0.01	0.21	0.04	0.01	-0.12	-0.09	0.02	0.26
P5. When U.H dental clinics promises to do something by a certain time, it does so.	0.76	-0.17	-0.22	-0.14	-0.20	-0.07	0.11	-0.11	0.00	0.26
P6. When you have a problem U.H dental clinic staff show a sincere interest in solving it.	0.78	0.15	0.06	-0.34	0.11	-0.07	-0.05	0.12	0.00	0.22
P7. U.H dental clinics performs the service right the first time.	0.73	-0.12	0.39	-0.09	-0.13	0.05	0.01	-0.05	0.06	0.27
P8. U.H dental clinics provides its service at the time it promises to do so.	0.80	0.03	-0.04	-0.08	-0.16	0.21	-0.09	0.01	-0.06	0.27
P9. Dental clinic insists on error free records	0.70	0.46	0.04	0.11	-0.07	-0.07	0.17	0.05	-0.02	0.25

From the results of factor analysis as presented in **table 16**, most reliability items mainly load more on factor 1, with provision of services at the promised time having the highest factor loading, it explains almost 80.07% variability in reliability of U.H employees. Sincere interest of U.H dental employees comes second accounting for almost 77.85% variability in employees' reliability in offering services. The promise keeping nature of U.H dental employees explains 75.76% of variation in reliability of dental facilities employees.

4.03.3 Responsiveness measurement scale/items validity and reliability tests

Reliability analysis was conducted on the final responsiveness measurement scale items to flag out problematic items (if any) before proceeding to exploratory factor analysis as recommended by Hair *et al. (*2010). The analysis involved calculating item to total correlations and coefficient alpha (Churchill, 1979). The purpose of such and analysis process was to identify scale items with a CITCs lower than 0.4 on the responsiveness scale for deletion (Gliem & Gliem, 2003). The results of reliability analysis are presented in Table A1 in appendix section. From the reliability result table, the overall Cronbach's Alpha is 0.899 which surpasses the threshold set by Hair et al. (2010). On validity of the responsiveness items, the items have non-identity correlation matrix (det=0.012), Bartlett test of sphericity with a significant Chi-square value of 1686.94 (p=0.000, df=28) implying that the items are correlated with each other and Kaiser-Meyer-Olkin Measure of Sampling Adequacy value of 0.876, which passes the thresholds suggested by Kaiser (1974).

Table 17: KMO and Bartlett's Test for responsiveness Measurement Scale Items

Determinant of the correlation matrix	
Determinant	0.012
Bartlett test of sphericity	
Chi-square	1686.938
Degrees of freedom	28
p-value	0.000
H0: variables are not intercorrelated	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.876

Source: SERVQUAL Study results, 2021

Due to the fact that all 8 items are consistent with the laid down requirements of factor analysis, all were retained to the next stage of analysis. The items were subjected to factor analysis using Bartlet's method of scoring coefficients. And being that only one factor had an eigenvalue greater than 1 (**see figure 4.0.3.3**), only factor one was used in predicting responsiveness scores. Table 18 presents the factor loadings of the items after the factor analysis process. From the results, prompt services by employees explain almost 82.11% of variation in the responsiveness as an attribute. Employees in U.H dental clinic are never too busy to respond to your request account for 79.9% variance in responsiveness attribute. Willingness to help by U.H dental clinics accounts for 79.27% variance in responsiveness attribute (see **table 18**).

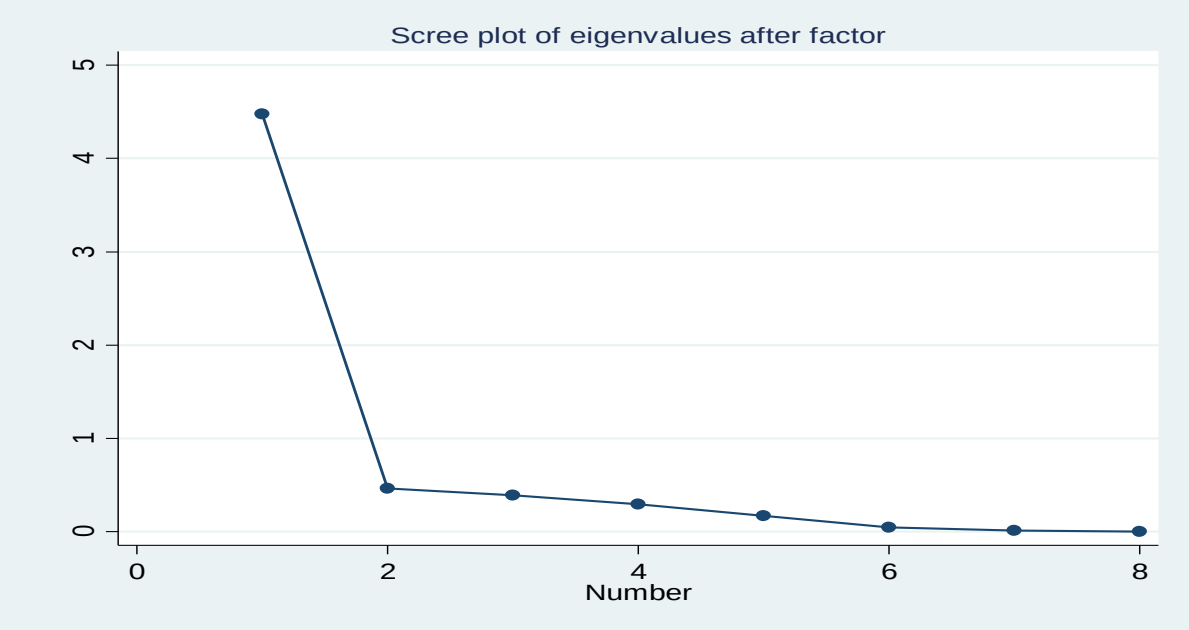


Figure 4.0.3.3: Scree plot of eigenvalues for responsiveness

Table 18: Factor loadings (pattern matrix) and unique variances for responsiveness scale items

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Uniqueness
E10. Employees of excellent U.H dental clinics will tell customers exactly when services will be performed.	0.7192	0.4175	-0.0694	-0.0605	0.1315	-0.0878	-0.0146	0.2748
E11. Employees of excellent U.H dental clinics will give prompt service to customers.	0.7014	0.0372	0.4247	0.1296	0.0787	-0.0379	0.0509	0.2992
E12. Employees of excellent U.H dental clinics will always be willing to help customers.	0.7485	0.2716	-0.0188	0.2258	-0.1778	0.0453	-0.0473	0.2787
E13. Employees of excellent U.H dental clinics will never be too busy to respond to customers' requests.	0.6711	-0.1378	-0.1415	0.2734	0.1593	0.1023	0.0155	0.3997
P10. Employees in a U.H dental clinic tell you exactly when services will be performed.	0.7198	0.1277	-0.1124	-0.3398	0.0735	0.0972	0.0233	0.3221
P11. Employees in a dental clinic give you prompt service.	0.8211	-0.2429	0.3086	-0.1791	-0.0585	0.0281	-0.0495	0.1329
P12. Employees in U.H dental clinics are always willing to help you.	0.7927	-0.0822	-0.166	-0.0274	-0.2619	-0.0386	0.0569	0.2632
P13. Employees in U.H dental clinic are never too busy to respond to your request.	0.7995	-0.3308	-0.225	0.0169	0.0989	-0.0941	-0.0268	0.1812

Source: SERVQUAL Study results, 2021

4.0.3.4 Assurance measurement scale/items validity and reliability tests

Before any process in factor analysis, the items were assessed on the reliability test to ascertain the internal consistency of the items. From the table A1 in the appendix section, the assurance items had a composite Cronbach's Alpha of 0.908, which is far above the threshold of 0.7 (Zikmund et al. 2010).

The assurance scale items were further subjected to exploratory factor analysis by running the Bartlett's Test of Sphericity and calculating the KMO statistic on the 8 items of the responsiveness measurement scale. These tests revealed that the Bartlett's Test of Sphericity had a significant

χ^2 value of 1676.091 (p<0.000, df=28) and an overall KMO value of 0.913 as shown in **Table 19**. These values exceeded the recommended threshold (Kaiser, 1974), providing the second justification to proceed with EFA; adequate sample size.

Table 19: KMO and Bartlett's Test for Assurance Measurement Scale Items

Determinant of the correlation matrix	
Determinant	0.013
Bartlett test of sphericity	
Chi-square	1676.091
Degrees of freedom	28
p-value	0.000
H0: variables are not intercorrelated	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.913

Source: SERVQUAL Study results, 2021

When factor analysis was carried on the assurance scale items, only one factor passed the recommended threshold, having an eigenvalue greater than one (Yong & Pearce, 2013) (see **figure 4.0.3.4**). And therefore, only one factor was predicted using a Bartlett's method to approximate the assurance score used in the further analysis.

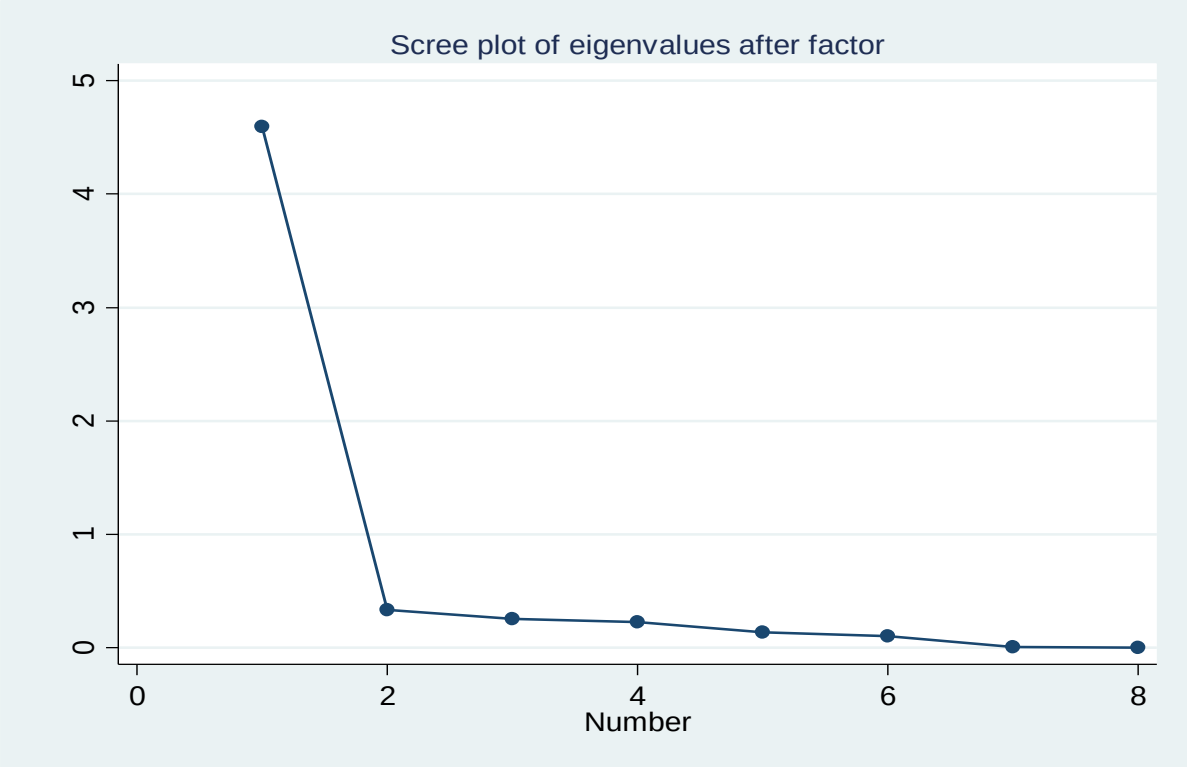


Figure 4.0.3.4: Scree plot of eigenvalues for assurance

Table 20: Factor loadings (pattern matrix) and unique variances for assurance scale items

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Uniqueness
E14. The behavior of employees in excellent U.H dental clinics will instill confidence in customers.	0.7399	0.0732	0.3045	0.1014	-0.1606	0.0049	-0.0296	0.3174
E15. Customers of excellent U.H dental clinics will feel safe in transactions.	0.7705	-0.0022	0.103	-0.1165	-0.0543	-0.2303	0.0299	0.3252
E16. Employees of excellent U.H dental clinics will be consistently courteous with customers.	0.7358	0.1139	-0.1505	0.3191	0.0707	-0.0385	0.0296	0.3138
E17. Employees of excellent U.H dental clinics will have the knowledge to answer customers' questions.	0.7397	0.427	-0.0754	-0.0433	0.0388	0.0576	-0.0204	0.2577
P14. The behavior of employees in dental clinic instills confidence in you.	0.7992	-0.2017	-0.0645	0.0385	-0.1755	0.1683	0.0245	0.2552
P15. You feel safe in your transactions with U.H dental clinics.	0.8056	-0.0952	-0.3009	-0.1895	-0.0605	-0.0476	-0.0262	0.2089
P16. Employees in dental clinic area consistently courteous with you.	0.7687	-0.2911	0.0569	0.1127	0.194	-0.0232	-0.0332	0.2691
P17. Employees in dental clinic have the knowledge to answer your questions.	0.6986	0.0136	0.1603	-0.2187	0.1716	0.1163	0.0275	0.3945

Source: SERVQUAL Study results, 2021

As shown in **table 20**, all the assurance items load mainly on factor one, feeling safe when transacting with the facilities loads highly on factor one compared to other items, implying that 80.56% variation in assurance is accountable to safe transaction in the facilities. Instilling confidence in customers by the employees comes the second most loading item accounting for 79.92% variability in assurance. Courtesy among the dental employees in clinics comes the third most loading item, accounting for 76.87% of variance in assurance.

4.0.3.5 Empathy measurement scale/items validity and reliability tests

Preceding process of factor analysis, the empathy items were assessed on the reliability test to ascertain the internal consistency of the items. From the table A1 in the appendix section, the assurance items had a composite Cronbach's Alpha of 0.921, which is far above the threshold of 0.7 (Zikmund et al., 2010).

The empathy scale items were further subjected to exploratory factor analysis by running the Bartlett's Test of Sphericity and calculating the KMO statistic on the 10 items of the empathy measurement scale. These tests revealed that the Bartlett's Test of Sphericity had a significant χ^2 value of 2386.858 ($p<0.000$, $df=45$) and an overall KMO value of 0.922 as shown in Table **21.** These values exceeded the recommended threshold (Kaiser, 1974), providing the second justification to proceed with EFA; adequate sample size.

Table 21: KMO and Bartlett's Test for Empathy Measurement Scale Items

Determinant of the correlation matrix	
Determinant	0.002
Bartlett test of sphericity	
Chi-square	2386.858
Degrees of freedom	45
p-value	0.000
H0: variables are not intercorrelated	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.922

Source: SERVQUAL Study results, 2021

When factor analysis was carried on the assurance scale items, only one factor passed the recommended threshold, having an eigenvalue greater than one (Yong, 2013) (see figure 4.0.3.5). And therefore, only one factor was predicted using a Bartlett's method to approximate the assurance score used in the further analysis.

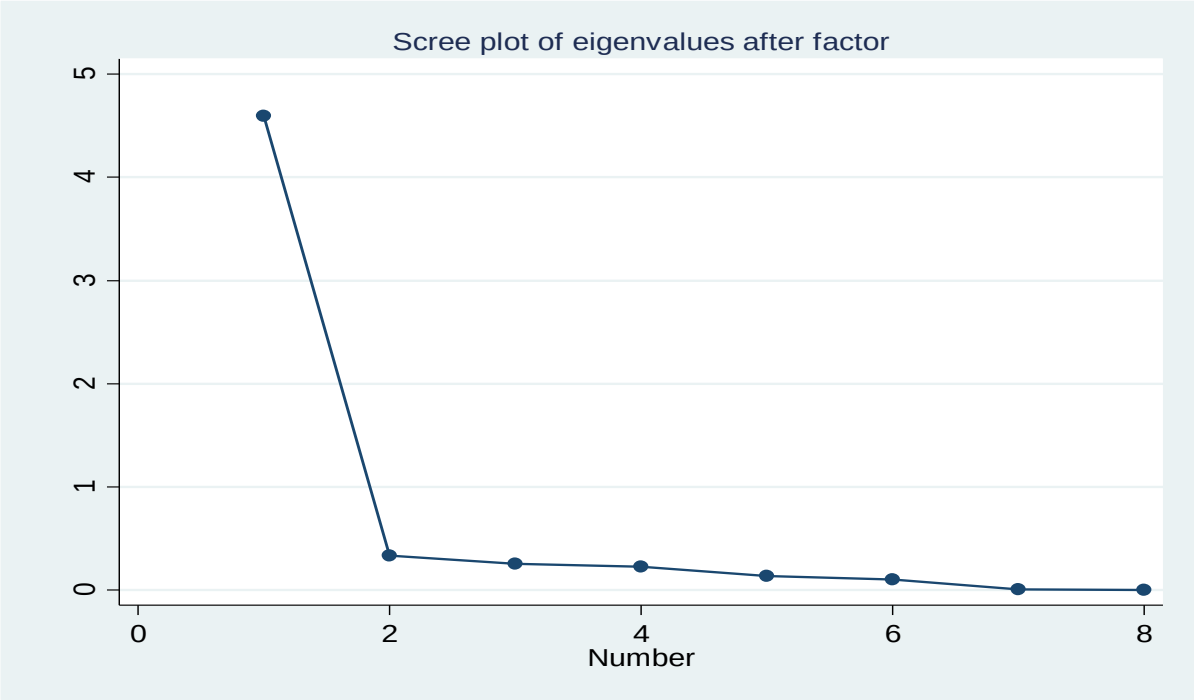


Figure 4.0.3.5: Scree plot of eigenvalues for empathy

Table 22: Factor loadings (pattern matrix) and unique variances for empathy scale items

Variable	Fac1	Fac2	Fac3	Fac4	Fac5	Fac6	Fac7	Fac8	Fac9	Uniquenes s
E18. Excellent U.H dental clinics will give customers individual attention.	0.76	-0.20	0.11	-0.01	0.21	0.15	0.14	0.01	-0.02	0.28
E19. Excellent U.H dental clinics will have operating hours convenient to all their customers.	0.65	0.34	0.34	0.07	0.11	0.01	-0.08	-0.03	-0.03	0.32
E20. Excellent U.H dental clinics will have employees who give customers personal attention.	0.81	-0.23	0.25	-0.10	-0.10	-0.03	-0.03	-0.09	0.05	0.19
E21. Excellent U.H dental clinics will have their customer's best interests at heart.	0.76	-0.21	-0.04	0.37	-0.08	-0.03	0.08	0.02	0.01	0.22
E22. The employees of excellent U.H dental clinics will understand the specific needs of their customers.	0.80	-0.16	0.05	0.03	-0.14	0.05	-0.17	0.10	-0.01	0.27
P18. U.H dental clinic gives you individual attention.	0.77	0.00	-0.07	-0.18	0.25	-0.12	-0.01	0.08	0.03	0.28
P19. U.H dental clinic has operating hours convenient to all its customers.	0.64	0.50	0.04	0.04	-0.14	-0.03	0.11	0.04	0.02	0.30
P20. U.H dental clinic has employees who give you personal attention.	0.82	-0.09	-0.07	-0.22	-0.17	-0.13	0.07	-0.02	-0.05	0.21
P21. U.H dental clinic has your best interest at heart.	0.82	0.07	-0.32	0.15	0.13	-0.07	-0.09	-0.08	-0.01	0.17
P22. The employees of U.H dental clinic understand your specific needs.	0.71	0.15	-0.24	-0.14	-0.08	0.23	-0.02	-0.02	0.02	0.34

Source: SERVQUAL Study results, 2021

As shown in table **22**, the entire empathy items load mainly on factor one, employees' personal attention to customers load highly on factor one compared to other items, implying that 81.44% variation in employee's empathy is accountable to personal attention. Employees having best interest at heart by the comes the second most loading item, accounting for 81.60% variability in empathy. Understanding the specific needs of the customers by the dental employees in clinics comes the third most loading item, accounting for 79.7% of variance in empathy.

4.0.4 Summaries of revisit intentions and recommendation willingness

The **table 23** below presents a descriptive summary of respondents' revisit intention and willingness to recommend services at university hospital dental clinics. Both variables were captured using a 7 points Likert scale, where 1 represents strong disagreement and 7 strong agreements. From the output, the revisit intention had an overall mean score of 6.619 while

willingness to recommend services had a mean score of 6.644. Both variables scored high positivity values indicating a high degree of agreement with the statements.

When the revisit intention scores were disaggregated by gender, the results showed that female respondents (mean=6.646) were more willing to seek care in the future at university hospital dental clinics than males (mean=6.587), however, the difference was not statistically significant (t-test, p-value=0.523). Similarly, the results of patient willingness to recommend services at university hospital dental clinics showed that females (mean=6.718) were more willing to recommend than males (mean=6.559), though the difference in scores was not statistically significant (t-test, p=0.098).

The two indicators of satisfaction were further disaggregated by education level. In regard to revisit intention, those with a university education were more willing to revisit the dental clinic facilities than other cohorts, while the least group in terms of willingness to revisit the clinic facilities were those with 'less than primary' education level. However, the difference in the averages was found to be insignificant (ANOVA, p=0.405).

Table 23: Summary of revisit intention and recommendation

	N	Mean	T-test (p-value)
Revisit intention			
Male	179	6.587	
Female	209	6.646	**0.523**
Overall	388	6.619	
Recommendation T-test (p-value)			
Male	179	6.559	
Female	209	6.718	**0.098**
Overall	388	6.644	
Revisit intention ANOVA (p-value)			
Less than primary	18	6.500	
Primary	33	6.576	
Secondary	117	6.521	
University	220	6.686	**0.405**
Overall	388	6.619	
Recommendation ANOVA (p-value)			
Less than primary	18	6.389	
Primary	33	6.879	
Secondary	117	6.487	
University	220	6.714	**0.051**
Overall	388	6.644	

Source: SERVQUAL Study results, 2021

In contrast, those respondents who fall in the primary level of education (mean=6.879) were more willing to recommend the facilities than other levels of education. Subsequent categories were, University education level (mean=6.714), Secondary (6.487) and lastly, less than primary (mean=6.389) in that order of decreasing willingness. Though disparity was observed, the mean score was insignificant based on ANOVA (p=0.051).

4.0.4.1 Satisfaction Score

To come up with satisfaction score, which is manifested in patients' revisit and recommendation intention, factor analysis with weighted scores was used. But before the actual factor analysis, the two items: revisit intention and willingness to recommend were subjected to reliability analysis to ascertain whether the items were consistent in measuring one subject "satisfaction" (Taber, 2018; Churchill, 1979). The Cronbach's alpha coefficient was used to validate the internal consistency and reliability of the items and the results are as shown in **table 24**.

Table 24: Composite Reliability statistics

Test scale = mean(unstandardized items)	Statistic
Average interitem covariance:	0.634
Number of items in the scale:	2.000
Scale reliability coefficient:	**0.848**

Source: SERVQUAL Study results, 2021

From the output in **table 24** the Cronbach's alpha coefficient was 0.848, which surpasses the threshold of 0.7 (Hair et al., 1998), hence the two items offered a reliable scale in predicting and measuring satisfaction levels. Therefore, the two items were taken to the next stage of analysis involving explanatory factor analysis for two satisfaction measurements scale items, whose results are presented in table **25**. The results are based on Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO).

Table 25: KMO and Bartlett's Test for satisfaction Measurement Scale Items

Bartlett test of Sphericity	
Chi-square	301.718
Degrees of freedom	1
p-value	0.000
Kaiser-Meyer-Olkin Measure of Sampling	
KMO	0.500

Source: SERVQUAL Study results, 2021

The Bartlett's Test of Sphericity produced a significant χ^2 value of 301.78 ($p<0.000$; $df=1$) and KMO index of 0.50, which is an indication that the measurement scale items are correlated, and

sample adequacy requirement met and therefore suitable for factor analysis process. (Kaiser, 1960). The two scale items for satisfaction were then subjected to factor analysis process using iterated principal factors method. During the process, only one factor was retained having an eigenvalue greater than 1 based on Kaiser criterion (Cliff, 1988; Nounally, 1978). The retained single factor was then used to predict and conceptualize satisfaction level scores of the customers towards the service quality offered in dental clinics.

4.0.4.2 Summary of satisfaction level score

This section presents the summary statistics of the satisfaction level score that was calculated from the observed variables: revisit intention and willingness to recommend the services to another person. The score was rescaled in the interval 0-100 with 100 showing a high satisfaction score. The overall average satisfaction score is estimated at 93.854.

4.0.3.2.1 Summary of satisfaction score by gender

Table 26: Summary of satisfaction score by gender

Gender	N	Mean	Std. dev
Female	209	94.686	13.329
Male	179	92.881	15.549
Total	**388**	**93.854**	**14.405**

Source: SERVQUAL Study results, 2021

The **table 26** above shows a summary of satisfaction score by gender. From the tabulation, females had a higher satisfaction score than their male counterparts. Though the satisfaction score for females was higher than that of males, further assessment of mean difference using t-test revealed that the difference was not significant at 5 percent level of significance (t-test, t(336)= 1.231, p-value= 0.2189).

4.0.4.2.2 Summary of satisfaction score by age group

Table 27: Summary of satisfaction score by age group

Age	N	Mean	SD
18-25	81	94.033	13.622
26-34	94	94.759	13.561
35-40	110	93.865	13.380
51-64	83	93.264	16.891
65 and above	20	91.257	16.554
Total	**388**	**93.854**	**14.405**

The **Table 27** presents the summary of satisfaction score by age groups. The distribution of scores depicts a decreasing mean score of satisfaction with increasing age of the respondents. The highest satisfaction mean score (94.759, SD=13.561) was in the 18-34 age group. The lowest satisfaction mean score (91.257, SD=16.554) was registered among those in the 65 and above age bracket. To ascertain whether the mean satisfaction scores across the age groups was statistically significant analysis of variance (ANOVA) was done. The ANOVA results showed that the difference in the mean score across age groups was not significant (ANOVA, P-value= 0.8838).

4.0.4.2.3 Summary of satisfaction scores by education level

Further disaggregation of mean satisfaction scores was done by the level of education as shown in the bar graph in appendix. The individuals having primary level of education had the highest satisfaction score (95.4), followed by university and secondary level of education with satisfaction mean score of 95.0 and 91.7 respectively. Individuals with less than primary education recorded the least satisfaction score of 90.8. To determine whether the observed difference in satisfaction score across the education levels was statistically significant, analysis of variance was done. The ANOVA test result showed that there was no significant difference of the mean satisfaction scores across the different education level groupings (ANOVA, p= 0.1637).

4.0.4.2.4 Summary of satisfaction score by income level

The satisfaction score was further disaggregated by income level as shown in **table 28**. The highest satisfaction mean score was found in those with income levels ranging between KES. 12,299 to 23,885 had the highest satisfaction mean score. The mean satisfaction score was lowest among the individuals with an income level of less than KES. 12,298. The satisfaction scores of the other income level groups are also highlighted in table 4.0.3.6.

Table 28: Summary of satisfaction score by income level

Income	N	Mean	SD
12299-23885	51	95.591	9.108
23886-35472	50	91.982	17.275
35473-47059	30	93.889	12.165
above-47059	37	93.915	10.533
No income	174	94.774	13.111
<=12298	46	90.408	22.354
Total	**388**	**93.854**	**14.405**

Source: SERVQUAL Study results, 2021

Analysis of variance (ANOVA) was employed to test if the difference in mean satisfaction scores across the income level groupings was statistically significant. The difference across income levels was not significant (ANOVA, p= 0.4264).

4.0.4.0 Regression analysis results and findings: Multiple Linear Regressions (OLS)

Multiple linear regression is an extension of linear regression with more than one explanatory variable, with a assumption that the response variable has a directly related to linear combination of the explanatory variables (Tranmer & Elliot, 2008). The equation for multiple linear regression has the same form as that for simple linear regression but has more terms:

$$yi=\beta 0+\beta 1x1i+\beta 2x2i+\cdots+\beta pxpi+ei$$

Where β_I (i=0,1…….p) are the coefficients of the regression model, and e_I is the error term assumed to be following a normal distribution with mean zero and a variance of σ^2. The assumption of linearity was tested using the power correlation test as shown in **table 29**. The shows that the response and the explanatory variables were all having a significant relationship (see column 1). Since the linearity assumption was met the study proceeded to fitting the model for the further hypothesis testing.

Table 29: Pairwise correlations of the response and explanatory variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) SATISFACTION	1.000					
(2) TANGIBLES	0.465*	1.000				
	(0.000)					
(3) RELIABILITY	0.453*	0.708*	1.000			
	(0.000)	(0.000)				
(4) RESPONSIVENESS	0.430*	0.670*	0.801*	1.000		
	(0.000)	(0.000)	(0.000)			
(5) ASSUARANCE	0.644*	0.627*	0.636*	0.735*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)		
(6) EMPATHY	0.655*	0.577*	0.555*	0.639*	0.838*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Note: *** *p<0.01, ** p<0.05, * p<0.1*

To establish the influence of the five service quality factors on the satisfaction level of customers a multiple linear regression model was deployed.

Y (Satisfaction) = a+ β1 (tangibles) + β2 (reliability) + β3 (responsiveness) + β4 (assurance) + β5 (empathy)

β1 (tangibles) =0.006, p-value=0.000

β2 (reliability)=0.033, p-value =0.000
β3 (responsiveness)=0.234, p-value =0.000
β4 (assurance) =0.073, p-value =0.000
β5 (empathy) = 0.016, p-value =0.000

The null hypotheses to be tested in the study included:

$A.\ H_0: Tangible\ (physical\ facilities, equipment\ and\ dress\ code\ of\ staff)\ has\ no\ significant\ influence\ on\ satisfaction\ level\ of\ customers\ in\ the\ university\ dental\ clinics$

$B.\ H_0: Reliability\ (service\ delivery\ is\ dependable\ and\ accurate)\ has\ no\ significant\ influence\ on\ satisfaction\ level\ of\ customers\ in\ the\ university\ dental\ clinics$

$C.\ H_0: Responsiveness\ (to\ help\ patients\ and\ serve\ them\ promptly)\ has\ no\ significant\ influence\ on\ satisfaction\ level\ of\ customers\ in\ the\ university\ dental\ clinics$

$D.\ H_0: Assurance\ (competency\ of\ staff\ and\ their\ ability\ to\ inspire)\ has\ no\ significant\ influence\ on\ satisfaction\ level\ of\ customers\ in\ the\ university\ dental\ clinics$

$E.\ H_0: Empathy\ (caring\ and\ personal\ attention\ to\ patients)\ has\ no\ significant\ influence\ on\ satisfaction\ level\ of\ customers\ in\ the\ university\ dental\ clinics$

Based on results output in **table 30**, Service quality dimensions explained 62.7% variability in satisfaction level of patients visiting hospital dental clinics (supported by R-squared of 0.627). All five dimensions are significant in explaining satisfaction level, the positive associations is supported by the evident positive coefficients found across the tangibles, reliability, responsiveness, assurance and empathy. This implies a positive relationship between the quality of services and the levels of satisfaction among patients.

Table 30: Results of multiple linear regressions with service quality dimension as independent variables and satisfaction score level as the dependent variable

Variables	Null Model	Saturated model	Socio-economic factors	Service Quality dimensions
Gender: Male		-0.501	-0.942	
		(1.543)	(1.565)	
Age: 26-36		1.652	1.926	
		(2.514)	(2.524)	
Age: 35-40		1.820	1.934	
		(2.547)	(2.583)	
Age: 51-64		1.282	1.262	
		(2.762)	(2.770)	
Age: 65 and above		0.866	0.391	
		(4.140)	(4.173)	
Education: Primary		5.522	4.609	
		(4.335)	(4.389)	

Education: Secondary		2.073	1.288	
		(3.866)	(3.929)	
Education: University		5.180	4.504	
		(4.095)	(4.155)	
Income: 23886-35472		-3.905	-3.717	
		(2.835)	(2.885)	
Income: 35473-47059		-1.649	-1.900	
		(3.347)	(3.387)	
Income: above 47059		-2.695	-2.287	
		(3.229)	(3.266)	
Income: No income		0.211	0.086	
		(2.528)	(2.540)	
Income: Up to 12298		-3.199	-4.032	
		(2.972)	(3.018)	
Tangibles		0.011***		0.006***
		(0.045)		(0.044)
Reliability		0.040***		0.033***
		(0.064)		(0.062)
Responsiveness		0.229***		0.234***
		(0.058)		(0.057)
Assurance		0.056***		0.073***
		(0.066)		(0.064)
Empathy		0.022***		0.016***
		(0.068)		(0.067)
Constant	93.854***	90.024***	90.932***	93.844***
	(0.731)	(5.369)	(5.436)	(0.739)
Observations	**388**	**388**	**388**	**388**
R-squared	**0.000**	**0.467**	**0.029**	**0.627**

Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1; Service quality dimensions influence are drawn from the last model containing only the dimensions. Base categories: gender- females, education level- less than primary, income- 12299-23885.

Analysing the five SERVQUAL components the results showed that tangibles and overall satisfaction had a positive and significant association. Assurance had a positive and significant association with the overall patient satisfaction score. Responsiveness showed a positive and statistically significant relationship with satisfaction level. Empathy and reliability dimensions, both had positive and statistically significant coefficients hence a positive correlation with patient satisfaction levels. The model showed positive coefficients consistently across all five SERVQUAL dimensions after including the socio-demographic characteristics and before inclusion of the variables. After removal of individual characteristics from the model however, the coefficient of determination (R-squared) increased significantly to 0.627 (62.7%) the highest recorded compared to the other three models fitted (column 1-3).

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussion, conclusions and recommendations of this study. The objective of this study was to determine patient satisfaction using SERVQUAL, their revisit intention and willingness to recommend services at university hospital dental clinics in Kenya. This was measured across the five principal dimensions that make up SERVQUAL namely: tangibles, reliability, responsiveness, assurance and empathy. The study sought to establish the significance of these five dimensions on overall patient satisfaction across different socio economic and demographic groups seeking services at Moi University and University of Nairobi dental hospitals in Kenya.

5.1 Summary of the study

The main objective of the study was to discern how the SERVQUAL dimension that includes tangible services, reliability of the services, responsiveness of the employees, assurance and empathy affects the overall satisfaction of the patients' utilizing the dental facilities in Kenya, focusing on two main used facilities, University of Nairobi and Moi University dental clinics. The data was collected on the 388 patients who have attended the facilities within the period preceding the study period, using a structured standard SERVQUAL questionnaire. The data was collected by well-trained research assistants who were thoroughly trained prior to the actual data collection process, on the use of online data collection and the theme of the questionnaire. The data was collected using the digital operationalized questionnaire in Open Data Kit (ODK), which enables quality data collection and reduces time during the data cleaning and coding as it offers a platform for coding the data prior to its collection. The sampling technique used in the study was convenient sampling, which is deemed to be easy, fast, and time-saving method. Data collected was then transferred to SPSS and analyzed to determine the underlying objectives. Both descriptive and inferential statistics were using to wrangle the data. The inferential mainly focused on multiple linear regression, done to ascertain the association between the SERVQUAL dimension and satisfaction level. The analysis of the model unveiled that the five service quality dimensions had a significant positive association with the patients' satisfaction level in the two sampled facilities. Next section gives the interpretation of the results and findings of the study.

5.2 Interpretation of research findings

The core objective of this study was to examine how the service quality dimensions defined in SERVQUAL influence patient satisfaction, revisit intention and recommendation among patients visiting University dental hospitals in Kenya. To achieve these objective descriptive statistics, regression and correlation statistical techniques were used to help determine the overall patient satisfaction level.

Overall, patient satisfaction was high with an overall average satisfaction score of 93.9%, this indicates that 6.1% of patients were dissatisfied with services at both institutions. This was a smaller proportion compared to 11.6% of respondents who reported dissatisfaction in a study conducted in a dental training hospital in South Africa by (White et al., 2001).

Socio-demographic factors accounted for 2.90% of variation in satisfaction level. There was no significant effect of individual characteristics (gender, age, income level and education level) on patient satisfaction levels. Though the demographic characteristics had an insignificant effect on patient satisfaction levels, females appeared to be more satisfied with the service delivery than male patients. (White et al., 2001) found lager mean differences among women than men surveyed in a university dental hospital that used SERVQUAL in South Africa. With respect to age, the results showed a decrease in overall patient satisfaction with corresponding increase in age. Overall patient satisfaction score increased with increasing level of income. This finding confirms the results by Kim and Park(2006) where they found no association between satisfaction level and demographic characteristics of the patients.

From the findings all fivefold dimensions of SERVQUAL were positive and significant in influencing the satisfaction level of patients surveyed and explaining 62.7% variability in the satisfaction level. This finding is consistent with findings made by (Mohamad, 2010) where they found positive associations between the service quality dimensions of SERVQUAL and satisfaction level among customers.

The dimension with the most influence on patient satisfaction level was responsiveness. This implies that patients feel satisfied when they are told precisely when a service will be performed, when the service is offered promptly, when staff are willing to help, and they respond readily to requests for help. The second most influential dimension was assurance which implies that the manner in which employees carry themselves instils confidence in patients. This is demonstrated through a friendly demeanor, courtesy, and sufficient knowledge to respond to patient needs. Ranked third was reliability which is characterized by employees keeping their word, showing a

sincere interest in resolving patient concerns and minimizing work related errors in their engagement with patients. Ranked fourth was empathy meaning the willingness to give personalized attention to patients. This includes having hours of operation that are convenient to patients as well as customizing the service delivery to meet the individual needs of patients. Ranked fifth was tangibles which is the physical environment within which service was delivered. This includes having modern equipment, aesthetically pleasing premises, comfortable clinics, neatness and organization within the workspaces. These findings tally with a study conducted by (Ramez, 2012) where responsiveness the most influential of the service quality dimension to patients. Others that were significant were empathy and tangibles respectively

On the second specific objective reliability analysis showed that revisit intention and reliability were consistent in measuring satisfaction. The two factors were subjected to factor analysis and a retained single factor used to predict overall satisfaction. Similarly (Ramez, 2012) found positive, and significant relationships between overall service quality, patient satisfaction and their future behaviour.

5.2.1 Influence of tangible services on satisfaction level score

The results indicate a significant effect of tangibles in explaining satisfaction level of customers (supported by β= 0.006, p-value < 0.000). This implies that as physical facilities, equipment and environment of care are improved within the dental clinic the satisfaction level of a customer increases. The study therefore rejected the null hypothesis because the probability value (P-value) is less than 5% level of significance and concludes that the tangible services are significant in explaining the satisfaction level of the patients. This is consistent with Boshoff and Gray (2004) who found that cleanliness of the hospital, neatness of buildings influence satisfaction of patients and positively impacts patient loyalty.

5.2.2 Influence of reliability dimension on satisfaction level score

From the findings, service reliability is statistically significant in explaining the satisfaction level of a patient (supported by β= 0.033, p-value =0.000). This implies that as the reliability score increases by a unit there is an increase in satisfaction score by a factor of 0.033 holding other dimensions constant. The study therefore rejected the null hypothesis because the probability value (P-value) is less than 5% level of significance and concludes that the reliability is significant in explaining the patients' satisfaction. This finding is consistent with the findings of (Kazem et al., 2013) who found a positive correlation and significant influence of reliability on overall customer satisfaction level in a hospital setting.

5.2.3 Influence of responsiveness dimension on satisfaction level score

Responsiveness had positive and significant influence on the satisfaction patients (supported by β= 0.234, p-value =0.000). This means that for every increase in responsiveness score by a unit there is a predicted increase in satisfaction level score by 0.234. This finding is consistent with the findings of Ramez (2012) who found a significant and positive association between responsiveness and the overall satisfaction level of patients. Responsiveness ranked as the most influential pillar with a coefficient of 0.234 in this study which contradicts (Ramez, 2012) study where reliability was rated as the most important of all service quality dimensions.

5.2.4 Influence of assurance dimension on satisfaction level score

From the output table, the assurance dimension score (supported by β= 0.073, p-value=0.000) is positively significant in explaining the satisfaction level of patients. This means, for a unit increase in assurance score there is a predicted increase in satisfaction level by 0.073. This finding corroborates the study by Lim et al. (2018), whose findings revealed a positive and significant association between the assurance dimension and satisfaction of the patients within a facility.

5.2.5 Influence of Empathy dimension on satisfaction level score

From the result table, the empathy dimension score (supported by β= 0.016, p-value=0.000) is positively significant in explaining the satisfaction level of the customers. This means, for a unit increase in empathy score there is a predicted increase in satisfaction level by 0.016. The sampled dental clinics did not have convenient operating time for all their clients. This may be due to the fact that public university dental hospitals are closed on weekends when most patients are possibly off work. This might create some discrimination in service delivery which goes against customer centricity that is the belief in quality and accessible healthcare for all. This finding is similar to the study done by Ojo (2010), who found that individualization of patient care to meet their unique needs, giving personalized attention and being efficient positively impacted overall patient satisfaction.

5.2.6 Revisit intention and recommendation willingness

Both variables were captured on a seven-point Likert scale where 1 represents strong disagreement and 7 strong agreement. Both variables (revisit intention mean= 6.619 and willingness to recommend mean = 6.644) scored high positivity values indicating a high degree of agreement with the statements. This tallies with Kitapci et al.(2014) findings that customer satisfaction is a determinant of positive word of mouth recommendation and thus firms should strive to satisfy them as a way to expand their client base. Female respondents (mean=6.646) were more willing to seek care in the future at university hospital dental clinics than males

(mean=6.587), however, the difference was not statistically significant (t-test, p-value=0.523). Females (mean=6.718) were more willing to recommend than males (mean=6.559), though the difference in scores was not statistically significant (t-test, p=0.098).These findings tally with the findings by Becker et al. (2000) where no significant differences in willingness to recommend services was found between gender groups.

Those with a university education were most willing to revisit the dental clinic while those least willing to revisit the clinic were those with 'less than primary' education. The difference in the averages was found to be insignificant (ANOVA, p=0.405). It was also found that those respondents who fall in the primary level of education (mean=6.879) were more willing to recommend the facilities than other levels of education. However, the difference in the averages was found to be insignificant (ANOVA, p=0.405). This finding contradicted what had been previously reported by Oswald (1998) where the higher the level of education one had, the more such a person was concerned about their health.

5.2 Implications of study findings

The results from this study indicate that service quality does influence patient satisfaction meaning that improving service quality will increase patient satisfaction, revisit intention and recommendation. The understanding and measurement of service quality is integral to provision of patient centred care. From the empirical model the service quality dimensions influenced patient satisfaction in descending order as follows: responsiveness, assurance, reliability, empathy, and tangibles.

The results showed no significant effect of individual characteristics (gender, age, income level and education level) on patient satisfaction levels. Though the demographic characteristics (gender, age, education, income) had no significant effect on patient satisfaction levels, females appeared to be more satisfied with the service delivery than male patients whereas (White et al., 2001) found greater variability rather than a higher degree of satisfaction among female than male patients.

In 2015 the government of Kenya through the ministry of health launched the managed medical equipment scheme program. The aim of the scheme was to equip two hospitals in all forty-seven counties and four national referral hospitals with outsourced specialized state of the art medical equipment. The scheme has been fraught with challenges some centered on the financing of the outsourced equipment but the critical ones centered on lack of healthcare workers capable of using the equipment. The findings of this study contradict some of the assumptions made about the true needs of patients within the healthcare system in Kenya with tangibles being the least

critical factor. The other four factors responsiveness, assurance reliability and empathy are all related to human resources for health who are the people who interact with patients and are the primary drivers of healthcare service. Human resource for health has been an area that has been neglected for long and is evidenced by the numerous strikes by healthcare workers of all cadres with oral healthcare workers included. There is therefore a need to find a balance in order to deliver quality healthcare services to Kenyans with more emphasis on human resource for health than solely on equipment and facilities.(Awino, 2016)

This study used SERVQUAL which is a service industry tool for measuring service quality and thus the findings can be compared with findings in other service sectors despite healthcare being unique in some way. The dimensions with gaps for improvement (negative gap scores) were found to be responsiveness and empathy. These two attributes centre on the willingness of healthcare workers to be eager and willing to help patients, to be caring, understanding and accommodate them. This can be attributed to the unique nature of healthcare where patients are vulnerable and lack full awareness of their illness or some of the treatment procedures needed to make them better. This is consistent with the findings of (Kazemi et al., 2013)who found that healthcare workers were not eager to help, they lacked time to meet patient requirements and even communicate clearly to them about their care requirements. Similarly the findings of a study conducted with a different tool at a University in Lagos Nigeria affirmed that interpersonal skills of employees and the relationship with patients were related to high patient satisfaction.(Adeniyi et al., 2013) Across industries, in the banking sector Lenka et al, (2009) found that human aspects of service quality were found to impact service quality more than technical and tangible aspects. In addition, customer satisfaction furthers customer loyalty. These findings are consistent with the findings in the health sector.

The study further shows that satisfaction leads to loyalty characterized by revisit and recommendation of services. This is consistent with findings in private healthcare facilities as reported by Boshoff and Gray (2004). This can help us understand the reasons as to why negative perceptions of healthcare services in public institutions in Kenya lead to low utilization. Focusing on quality and specifically addressing the responsiveness of healthcare workers can increase patient satisfaction and thus improve uptake and future utilization of services. It also suggests that government policy and funding should concentrate on human resource for health simultaneously with infrastructure investment in the public health sector (Awino, 2016). The study also builds on the empirical models used in modelling the SERVQUAL dimension using the factor analysis and regression models.

5.3. Recommendations

Public university dental hospitals in Kenya can improve patient satisfaction and increase patient inflows by putting emphasis on the non-tangible and tangible aspects of service delivery. The attributes of responsiveness, assurance, reliability and empathy are attributable to human resource for health. To help the dental clinic staff serve patients better they need to be technically competent and equipped on customer care, communication skills and emotional intelligence. The curriculum for dental training should incorporate courses such as organizational behaviour to equip the young dental professionals to engage with patients meaningfully. The hours of operation can also be reviewed in order to accommodate more patients. A neat and clean working environment also contributes to overall patient satisfaction and can be achieved by putting in place proper standard operating procedures.

5.4 Limitations

The timing of the survey coincided with the global covid-19 pandemic which delayed data collection because of nationwide lockdown restrictions. The survey was conducted in university teaching hospitals specialized in oral health and the findings may not be generalizable to other institutions in the public or private sector. The structured nature of the questionnaire may have confined the respondents' answers to the questions and not fully captured their sentiments.

5.5 Areas for further research

This study focused on one segment of the healthcare system that is oral health and specifically teaching hospitals. Future research should extend this to other areas of the public health sector. The study also points to human resource for health traits being the leading drivers of patient satisfaction and resultant service utilization. Further studies on patient satisfaction should explore what influences behaviour among health workers which is not captured in this study.

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APPENDICES

Table A1: Cronbach alpha statistics for the five dimensions of SERVQUAL

Item (s)	Obs	Cronbach alpha when item deleted	Overall Cronbach alpha for dimensions
Tangibles (items==8)			
E1. Excellent U.H dental clinics will have modern looking equipment.	388	0.850	
E2. The physical facilities at excellent U.H dental clinics will be visually appealing.	388	0.847	
E3. Employees at excellent U.H dental clinics will be neat appearing.	388	0.852	
E4. Materials associated with the service (such as pamphlets or statements) will be visually appealing at an excellent U.H dental clinics.	388	0.843	
P1. This U.H dental clinic has modern looking equipment.	388	0.847	
P2. This U.H dental clinic's physical facilities are visually appealing.	388	0.841	
P3. This U.H dental clinic's reception desk employees are neat appearing.	388	0.856	
P4. Materials associated with the service (such as pamphlets or statements) are visually appealing at this U.H dental clinic.	388	0.845	**0.864**
Reliability (items==10)			
E5. When excellent U.H dental clinics promise to do something by a certain time, they do.	388	0.893	
E6. When a customer has a problem, excellent U.H dental clinics will show a sincere interest in solving it.	388	0.896	
E7. Excellent U.H dental clinics will perform the service right the first time.	388	0.900	
E8. Excellent U.H dental clinics will provide the service at the time they promise to do so.	388	0.900	
E9. Excellent U.H dental clinics will insist on error free records	388	0.900	
P5. When U.H dental clinics promises to do something by a certain time, it does so.	388	0.893	
P6. When you have a problem U.H dental clinic staff show a sincere interest in solving it.	388	0.894	
P7. U.H dental clinics performs the service right the first time.	388	0.895	
P8. U.H dental clinics provides its service at the time it promises to do so.	388	0.890	
P9. Dental clinic insists on error free records	388	0.897	**0.905**

Responsiveness (items==8)			
E10. Employees of excellent U.H dental clinics will tell customers exactly when services will be performed.	388	0.889	
E11. Employees of excellent U.H dental clinics will give prompt service to customers.	388	0.890	
E12. Employees of excellent U.H dental clinics will always be willing to help customers.	388	0.887	
E13. Employees of excellent U.H dental clinics will never be too busy to respond to customers' requests.	388	0.892	
P10. Employees in a U.H dental clinic tell you exactly when services will be performed.	388	0.888	
P11. Employees in a dental clinic give you prompt service.	388	0.880	
P12. Employees in U.H dental clinics are always willing to help you.	388	0.882	
P13. Employees in U.H dental clinic are never too busy to respond to your request.	388	0.881	**0.899**
Assurance (items==8)			
E14. The behaviour of employees in excellent U.H dental clinics will instil confidence in customers.	388	0.898	
E15. Customers of excellent U.H dental clinics will feel safe in transactions.	388	0.894	
E16. Employees of excellent U.H dental clinics will be consistently courteous with customers.	388	0.897	
E17. Employees of excellent U.H dental clinics will have the knowledge to answer customers' questions.	388	0.898	
P14. The behaviour of employees in dental clinic instils confidence in you.	388	0.892	
P15. You feel safe in your transactions with U.H dental clinics.	388	0.893	
P16. Employees in dental clinic area consistently courteous with you.	388	0.895	
P17. Employees in dental clinic have the knowledge to answer your questions.	388	0.900	**0.908**
Empathy (items==10)			
E18. Excellent U.H dental clinics will give customers individual attention.	388	0.913	
E19. Excellent U.H dental clinics will have operating hours convenient to all their customers.	388	0.919	
E20. Excellent U.H dental clinics will have employees who give customers personal attention.	388	0.910	**0.921**

E21. Excellent U.H dental clinics will have their customer's best interests at heart.	388	0.913	
E22. The employees of excellent U.H dental clinics will understand the specific needs of their customers.	388	0.910	
P18. U.H dental clinic gives you individual attention.	388	0.912	
P19. U.H dental clinic has operating hours convenient to all its customers.	388	0.921	
P20. U.H dental clinic has employees who give you personal attention.	388	0.909	
P21. U.H dental clinic has your best interest at heart.	388	0.910	
P22. The employees of U.H dental clinic understand your specific needs.	388	0.915	

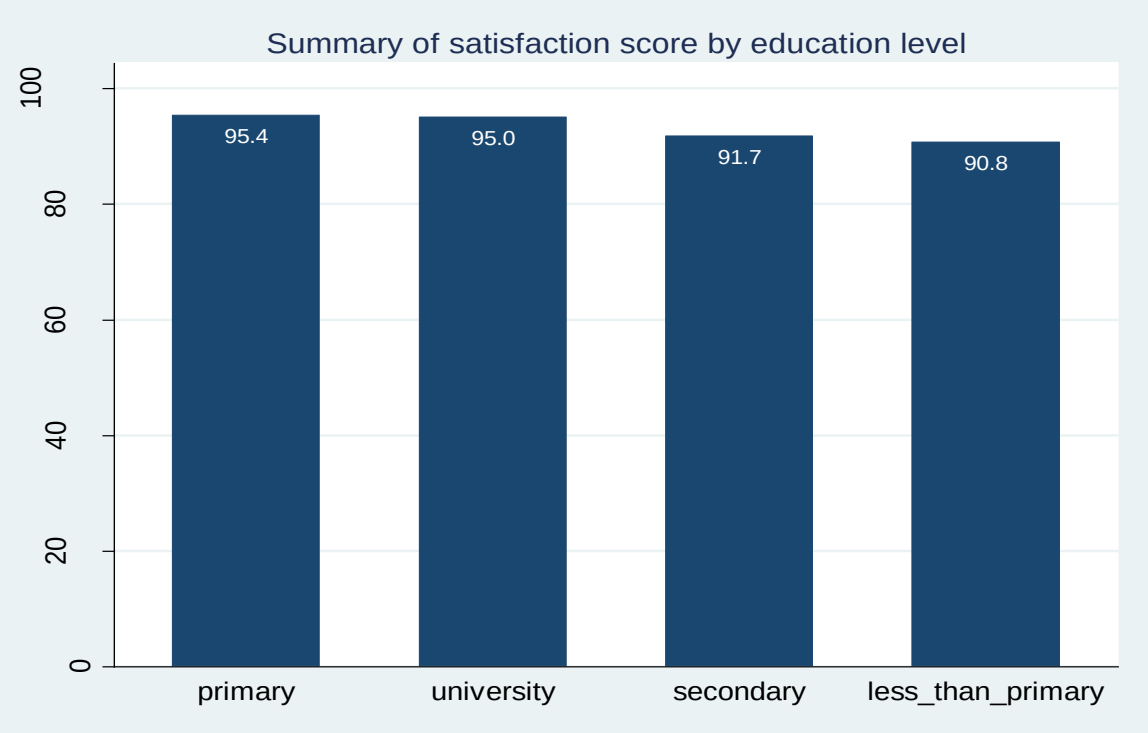

Figure 6: Summary of satisfaction level by education attainment

APPENDIX I: CONSENT FORM

Title of Study: Patient satisfaction with service quality in Kenyan university dental hospitals

Description of the study

You are invited to participate in a survey conducted by Edward Mungure Kabubei, an MBA in Healthcare Management student at Strathmore University Business School. The study aims at providing information on your expectations and experience of service quality in this institution. Your participation is voluntary, and it will involve being interviewed and a questionnaire being filled by a research assistant.

Risks

There are no anticipated risks associated with taking part in this survey. It will involve answering a structured questionnaire on a tablet computer under the guidance of a research assistant.

Perceived benefits

The findings of this study will contribute to the existing body of knowledge in health systems research. The findings will also be used to give feedback to the respective institutions for service improvement. The results will also be useful in planning for quality and patient-centred oral health service delivery in Kenya.

Confidentiality

The information collected will be treated with utmost confidentiality and anonymity of the participants will be maintained at all times, during and after the study. The primary data collected will be kept securely and will only be used for this research.

Voluntary participation

Your participation in this study is entirely voluntary. You may choose not to participate, and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw from this study. No monetary compensation or otherwise is expected.

Contact information

For clarifications and inquiries on the consent please contact:

Edward Mungure Kabubei
0720 255 124
Institute of Healthcare Management.
Strathmore University Business School.

Or if you would like to contact someone independent anything about this research please contact:

The Secretary–Strathmore University Institutional Ethics Review Board,
P. O. BOX 59857, 00200, Nairobi,
Email ethicsreview@strathmore.edu
Tel number: +254 703 034 375

Consent

I have read/been read to this consent and have been allowed to ask questions. I give my consent to participate in this study.

- ☐ I AGREE TO TAKE PART IN THIS RESEARCH
- ☐ I DO NOT AGREE TO TAKE PART IN THIS RESEARCH

Storage of information on the completed questionnaire

- ☐ I AGREE to have my completed questionnaire stored for future data analysis
- ☐ I DO NOT AGREE to have my completed questionnaire stored for future data analysis

Participant's name: _____ Signature: _____ Date: _____

Declaration by the principal investigator

I have clearly explained to the participant the purpose and expected benefits of this study and have answered his/her questions regarding this research on the date on this consent form.

Investigators name: _____ Signature: _____ Date: _____

FOMU YA IDHINI

Kichwa cha Utafiti: Kuridhika kwa mgonjwa na ubora wa huduma katika hospitali za meno za vyuo vikuu Kenya

Maelezo ya utafiti

Unaalikwa kushiriki katika uchunguzi uliofanywa na Edward Mungure Kabubei, mwanafunzi wa MBA ya Usimamizi wa Afya katika Shule ya Biashara ya Chuo Kikuu cha Strathmore. Utafiti unakusudia kutoa habari juu ya matarajio yako na uzoefu wa ubora wa huduma katika taasisi hii. Ushiriki wako ni wa hiari na utahusisha kuhojiwa na dodoso la kujazwa na msaidizi wa utafiti.

Hatari

Hakuna hatari zinazotarajiwa kuhusishwa na kushiriki katika utafiti huu.

Faida zilizopatikana

Matokeo ya utafiti huu yatachangia mwili uliopo wa maarifa katika utafiti wa mifumo ya afya. Matokeo pia yatatumika kutoa maoni kwa taasisi husika kwa uboreshaji wa huduma. Matokeo hayo yatasaidia pia katika kupanga huduma bora ya afya ya mdomo nchini Kenya.

Usiri

Habari iliyokusanywa itatibiwa kwa usiri mkubwa na kutokujulikana kwa washiriki kutunzwa wakati wote, wakati na baada ya masomo. Data ya msingi iliyokusanywa itahifadhiwa salama na itatumika tu kwa utafiti huu.

Kushiriki kwa hiari

Ushiriki wako katika utafiti huu ni wa hiari kabisa. Unaweza kuchagua kutoshiriki na unaweza kuondoa idhini yako ya kushiriki wakati wowote. Hautaadhibiwa kwa njia yoyote ikiwa utaamua kutoshiriki au kujiondoa kutoka kwa utafiti huu. Hakuna fidia ya pesa au vinginevyo inatarajiwa.

Habari ya mawasiliano

Kwa ufafanuzi na maoni juu ya idhini tafadhali wasiliana:
Edward Mungure Kabubei
0720 255 124
Taasisi ya Usimamizi wa Afya.
Shule ya Biashara ya Chuo Kikuu cha Strathmore.

Au ikiwa ungependa kuwasiliana na mtu anayejitegemea chochote kuhusu utafiti huu tafadhali wasiliana na:
Katibu wa Taasisi ya Maadili ya Taasisi ya Chuo Kikuu cha Strathmore,
P. O. BOX 59857, 00200, Nairobi,
Tuma barua pepe ethicsreview@strathmore.edu
Nambari ya simu: +254 703 034 375

Dhibitisho

Nimesoma / nimesomewa idhini hii na nimeruhusiwa kuuliza maswali. Ninatoa idhini yangu ya kushiriki katika utafiti huu.

- Nakubali kujumuishwa kwa utafiti huu
- Sijakubali kujumuishwa kwa utafiti huu

Hifadhi ya habari kwenye dodoso lililokamilishwa

- Nimekubali kuwa dodoso langu lililokamilika limehifadhiwa kwa uchambuzi wa data ya baadaye
- Nimekataa kuwa na dodoso langu lililokamilishwa limehifadhiwa kwa uchambuzi wa data ya baadaye

Jina la Mshiriki: _____ Saini: _____ Tarehe: _____

Azimio la upelelezi mkuu

Nimeelezea wazi mshiriki kusudi na faida zinazotarajiwa za utafiti huu na nimejibu maswali yake kuhusu utafiti huu tarehe ya fomu ya idhini hii.

Jina la watafiti: _____ Saini: _____ Tarehe: _____

APPENDIX 2: QUESTIONNAIRE

NAME/INITIALS CLINICAL SERVICE	…….. ……
GENDER	☐ Male ☐ Female
AGE (YEARS)	☐ 18-25 ☐ 26-34 ☐ 35-50 ☐ 51-64 ☐ 65-80
EDUCATION LEVEL	☐ University ☐ Secondary ☐ Primary ☐ Less than primary
INCOME LEVEL	☐ Up to 12,298 ☐ 12,299- 23, 885 ☐ 23,886- 35,472 ☐ 35, 473- 47,059 ☐ Above 47,059

THE SERVQUAL INSTRUMENT

THE SERVQUAL INSTRUMENT

EXPECTATIONS

This survey is concerned with your opinion of public university dental clinics. Please state how much you think these clinics should possess the features described below. We are interested in a number that best matches your expectations about public university dental clinics.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

PERCEPTIONS

This survey is concerned with your feelings about public university dental clinics. Please state the extent to which you think these clinics have the features described below. We are interested in a number that best matches your experience at this public university dental clinics.

Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

	(E)		(P)	Gap Score P - E
Tangibles		**Tangibles**		
E1. Excellent U.H dental clinics will have modern-looking equipment.	_____	P1. This U.H dental clinic has modern-looking equipment.	_____	_____
E2. The physical facilities at excellent U.H dental clinics will be visually appealing.	_____	P2. This U.H dental clinic's physical facilities are visually appealing.	_____	_____
E3. Employees at excellent U.H dental clinics will be neat appearing.	_____	P3. This U.H dental clinic's reception desk employees are neat appearing.	_____	_____
E4. Materials associated with the service (such as pamphlets or statements) will be visually appealing at an excellent U.H dental clinics.	_____	P4. Materials associated with the service (such as pamphlets or statements) are visually appealing at this U.H dental clinic.	_____	_____
		Average Tangibles SERVQUAL score		_____

EPP-E Reliability

Reliability

E5. When excellent U.H dental clinics promise to do something by a certain time, they do.	_____	P5. When U.H dental clinics promise to do something by a certain time, it does so.	_____ _____
E6. When a customer has a problem, excellent U.H dental clinics will show a sincere interest in solving it.	_____	P6. When you have a problem U.H dental clinic staff show a sincere interest in solving it.	_____ _____
E7. Excellent U.H dental clinics will perform the service right the first time.	_____	P7. U.H dental clinics perform the service right the first time.	_____ _____
E8. Excellent U.H dental clinics will provide the service at the time they promise to do so.	_____	P8. U.H dental clinics provide their service at the time it promises to do so.	_____ _____
E9. Excellent U.H dental clinics will insist on error-free records	_____	P9. Dental clinic insists on error-free records	_____ _____
		Average Responsiveness SERVQUAL score	_____

Responsiveness

E10. Employees of excellent U.H dental clinics will tell customers exactly when services will be performed.	_____	**Responsiveness** P10. Employees in a U.H dental clinic tell you exactly when services will be performed.	_____ _____
E11. Employees of excellent U.H dental clinics will give prompt service to customers.	_____	P11. Employees in a dental clinic give you prompt service.	_____ _____
E12. Employees of excellent U.H dental clinics will always be willing to help customers.	_____	P12. Employees in U.H dental clinics are always willing to help you.	_____ _____
E13. Employees of excellent U.H dental clinics will never be too busy to respond to customers' requests.	_____	P13. Employees in U.H dental clinic are never too busy to respond to your request.	_____ _____
		Average Responsiveness SERVQUAL score	_____

	E		P	P - E
Assurance		**Assurance**		
E14. The behavior of employees in excellent U.H dental clinics will instill confidence in customers.	_____	P14. The behavior of employees in a dental clinic instills confidence in you.	_____	_____
E15. Customers of excellent U.H dental clinics will feel safe in transactions.	_____	P15. You feel safe in your transactions with U.H dental clinics.	_____	_____
E16. Employees of excellent U.H dental clinics will be consistently courteous with customers.	_____	P16. Employees in the dental clinic area were consistently courteous with you.	_____	_____
E17. Employees of excellent U.H dental clinics will have the knowledge to answer customers' questions.	_____	P17. Employees in the dental clinic had the knowledge to answer your questions.	_____	_____
		Average Assurance SERVQUAL score		_____
Empathy		**Empathy**		
E18. Excellent U.H dental clinics will give customers individual attention.	_____	P18. U.H dental clinic gives you individual attention.	_____	_____
E19. Excellent U.H dental clinics will have operating hours convenient to all their customers.	_____	P19. U.H dental clinic has operating hours convenient to all its customers.	_____	_____
E20. Excellent U.H dental clinics will have employees who give customers personal attention.	_____	P20. U.H dental clinic has employees who give you personal attention.	_____	_____
E21. Excellent U.H dental clinics will have their customer's best interests at heart.	_____	P21. U.H dental clinic has your best interest at heart.	_____	_____
E22. The employees of excellent U.H dental clinics will understand the specific needs of their customers.	_____	P22. The employees of the U.H dental clinic understand your specific needs.	_____	_____
		Average Empathy SERVQUAL scores		_____

Revisit intention

I would consider coming back to this university dental hospital clinic to seek dental services in the future

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

Recommendation

I would recommend a family member/ co-worker/ friend to this university dental hospital clinic to seek dental services in the future

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

Measuring Service Quality Using SERVQUAL

STEPS TO OBTAIN UNWEIGHTED SERVQUAL SCORE

Step 1. Select an organization the service quality of which you want to assess. Using the SERVQUAL instrument, first obtain the score for each of the 22 expectation questions. Next, obtain a score for each of the perception questions. Calculate the Gap Score each of the statements (Gap Score = Perception – Expectation).

Step 2. Obtain an average Gap Score for each dimension by assessing the Gap Scores for each of the statements that constitute the dimension and dividing the sum by the number of statements making up the dimension.

Step 3. In the TABLE 1 transfer the average dimension SERVQUAL scores (for all five dimensions) from the SERVQUAL instrument. Sum up the scores and divide it by five to obtain the unweighted measure of service quality.

STEPS TO OBTAIN THE WEIGHTED SERVQUAL SCORE

Step 1. In Table 2 calculate the importance weights for each of the five dimensions constituting the SERVQUAL scale. (The instructions are provided along with the table).

Step 2. In Table 3 enter the average SERVQUAL score for each dimension (from Table 1) and the importance weight for each dimension (from Table 2). Then multiply the average score for each dimension with its importance weight.

Step 3. Add the weighted SERVQUAL scores for each dimension to obtain the overall weighted SERVQUAL score.

TABLE 1: CALCULATIONS TO OBTAIN UNWEIGHTED SERVQUAL SCORE

Average **Tangible** SERVQUAL score

Average **Reliability** SERVQUAL score

Average **Responsiveness** SERVQUAL score

Average **Assurance** SERVQUAL score

Average **Empathy** SERVQUAL score

TOTAL

AVERAGE (= Total / 5) UNWEIGHTED SERVQUAL SCORE

Table 2: SERVQUAL IMPORTANCE WEIGHTS

Listed below are five features of U.H dental clinics and the services they offer. We would like to know how much each of these features is important to the customer. Please allocate 100 points among the five features according to how important it is to you. Make sure the points add up to 100.

1. The appearance of the U.H dental clinic physical facilities, equipment, personnel, and communication materials.

_____ points

2. The U.H dental clinic's ability to perform the promised service dependably and accurately.

_____ points

3. The U.H dental clinic's willingness to help customers and provide prompt service

_____ points

4. The knowledge and courtesy of the U.H dental clinic's employees and their ability to convey trust and confidence.

_____ points

5. The caring, individual attention the U.H dental clinics provide its customers.

_____ points

Total: 100 points

Table 3: SERVQUAL WEIGHTED SCORES

SERVQUAL Dimension	Score from Table 1	**X**	Importance Weight from Table 2	**=** Weighted Score
Average **Tangible**				
Average **Reliability**				
Average **Responsiveness**				
Average **Assurance**				
Average **Empathy**				
				TOTAL
AVERAGE (= Total / 5) WEIGHTED SERVQUAL SCORE				

APPENDIX 3 Budget

Item	Unit	Rate	Total (Ksh)
1. Personnel costs			
a. Project coordinator	2	30,000	60,000
b. Data collectors	2	20,000	40,000
c. Data analyst	1	20,000	20,000
d. Statistician	1	20,000	20,000
2. Travel			
a. Daily commute	20 days	100	2,000
b. Subsistence costs (per diem)	20 days	100	2,000
3. Equipment			
a. Tablet computers	2	34,000	68,000
b. Laptop computer	1	40,000	40,000
4. Services and expendables			
a. Airtime	2	1,000	2,000
b. Internet	2	1,000	2,000
5. Special activities			
a. Report preparation	3	3,000	9,000
b. Manuscript publication	1	25,000	25,000
6. Monitoring and evaluation			
a. Weekly meetings	4	5,000	20,000
b. End of project conference	4	5,000	20,000
7. Contingencies			30,000
Grand Total			360,000

APPENDIX 4 SU-IERC AND NACOSTI APPROVALS

Strathmore UNIVERSITY

27th February 2020

Dr Kabubei, Edward
ekabubei@gmail.com

Dear Dr Kabubei,

RE: Patient Expectations and Perceptions of Service Quality in Kenyan University Dental Hospitals

This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0622/20.** The approval period is **27th February, 2020 to 26th February, 2021.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
27 FEB 2020
TEL: +254 (0)703 034 000
P. O. Box 59857 - 00200
NAIROBI - KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 812255

Date of Issue: 28/March/2020

RESEARCH LICENSE

This is to Certify that Dr.. edward mungure kaibubei of Strathmore University, has been licensed to conduct research in Nairobi, Uasin-Gishu on the topic: PATIENT EXPECTATIONS AND PERCEPTIONS OF SERVICE QUALITY IN KENYAN UNIVERSITY DENTAL HOSPITALS for the period ending : 28/March/2021.

License No: NACOSTI/P/20/4396

812255

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

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